

Subclones of portions of the 200 kDa protein gene from  $\lambda$ EMBL3 clone 8II and PCR amplification of 5' region

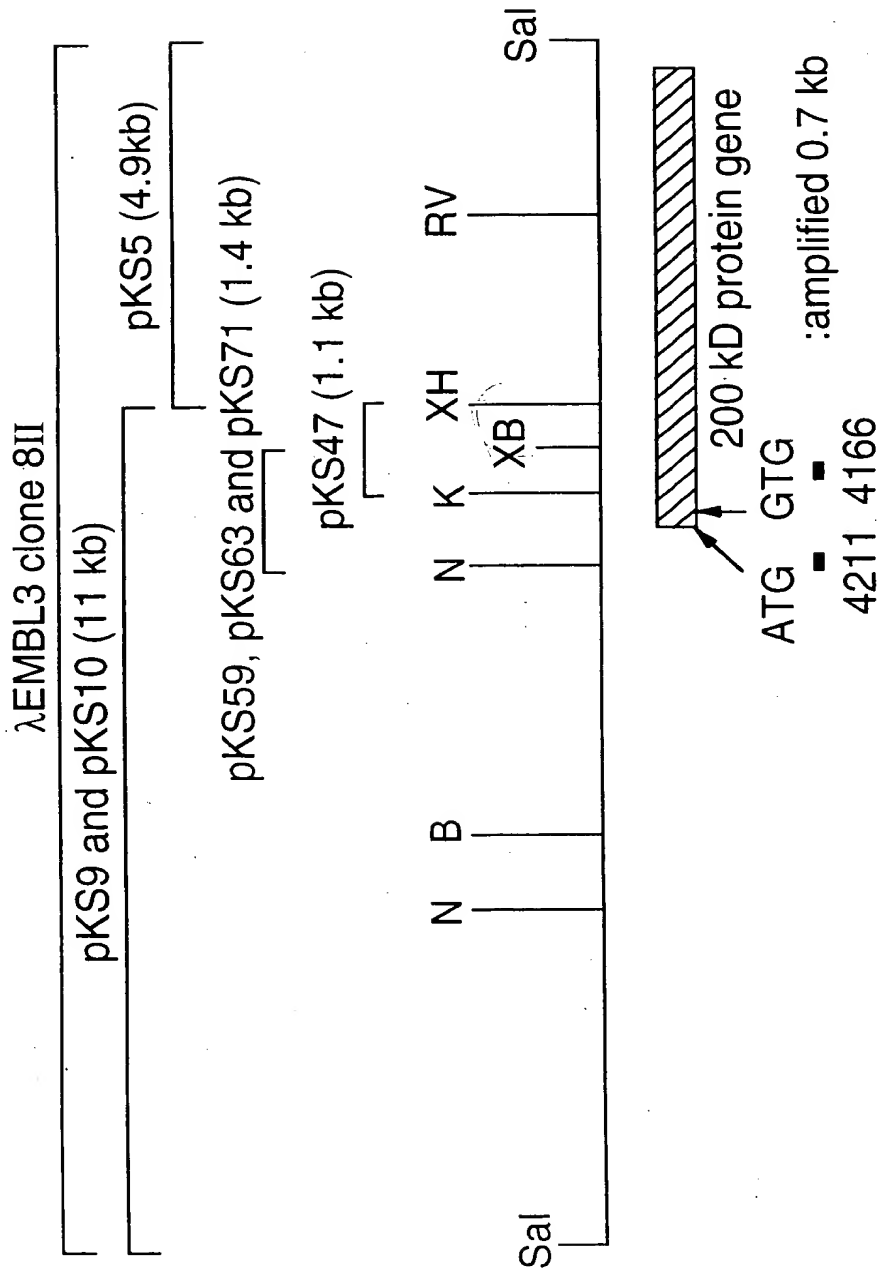


FIG.1

FIG.2A

*M. catarrhalis* strain 4223 AEMBL3 clone 200kDa gene

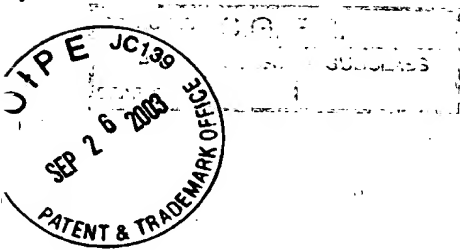
ccatggatat gggcagggtgt gctgcctgc cgtatgatgg ccatggaccc ccatttgccc 60  
catactgtga cgatttgaca tgtgatatga tttaacatgt gacatgattt aacattgttt 120  
aatactgttg ccacattac cataatttag taacgcattt agtaacgcac ttgtaaaaat 180  
cattgogccc ctttatgtgt atcatatgaa tagaatatta tgattgtatc tgattattgt 240  
atcagaatgg tgatgctata tgatgatgcc tacgagttga tttgggttaa tcaactctatg 300  
atttgatata ttttgaaact aatctattga cttaaatcac catatgggta taatttagca 360  
taatggtagg ctttttgtaa aaatcacatc gcaatattgt tctactgtta ctaccatgct 420  
tgaatgaaga tccaatcac cagattcatt caagtgatgt gtttgtatcac gcaccattta 480  
ccctaattat ttcaatcaaa tgcctatgtc agcatgtatc attttttttaa ggtaaaccac 540  
catgaatcac atctataaag tcatttttaa caaagccaca ggcacattta tggcagtggc 600  
agagtacgcc aaatcccaca gcaagggggg ggggtagctg tgctacaggg caagttggca 660



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2B

gtgtatgcac tctgagcttt gcccgatttg ccgcgctcgc tgtcctc gtg atc ggt 716  
Val Ile Gly  
1

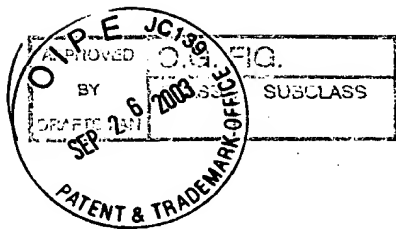
gca acg ctc agt ggc agt gct tat gct caa aaa gat acc aaa cat 764  
Ala Thr Leu Ser Gly Ser Ala Tyr Ala Gln Lys Lys Asp Thr Lys His  
5 10 15

atc gca att ggt gaa caa aac cag cca aga cgc tca ggc act gcc aag 812  
Ile Ala Ile Gly Glu Gln Asn Gln Pro Arg Arg Ser Gly Thr Ala Lys  
20 25 30 35

gog gac ggt gat cga gcc att gct att ggt gaa aat gct aac gca cag 860  
Ala Asp Gly Asp Arg Ala Ile Ala Ile Gly Glu Asn Ala Asn Ala Gln  
40 45 50

ggc ggt caa gcc atc gcc atc ggt atc ggt agt agt aat aaa act gtc aat gga 908  
Gly Gly Gln Ala Ile Ala Ile Gly Ser Ser Asn Lys Thr Val Asn Gly  
55 60 65

agc agt ttg gat aag ata ggt acc gat gct aog ggt caa gag tcc atc 956  
Ser Ser Leu Asp Lys Ile Gly Thr Asp Ala Thr Gly Gln Glu Ser Ile  
70 75 80



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2C

gcc atc ggt ggt gat gta aag gct agt ggt gat gcc tog att gcc atc 1004  
Ala Ile Gly Gly Asp Val Lys Ala Ser Gly Asp Ala Ser Ile Ala Ile  
85 90 95

ggt agt gat gac tta cat ttg ctt gat cag cat ggt aat cct aaa cat 1052  
Gly Ser Asp Asp Leu His Leu Asp Gln His Gly Asn Pro Lys His  
100 105 110 115

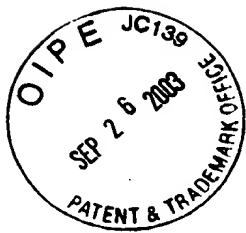
cog aaa ggt act ctg att aac gat ctt att aac ggc cat gca gta tta 1100  
Pro Lys Gly Thr Leu Ile Asn Asp Leu Ile Asn Gly His Ala Val Leu  
120 125 130

aaa gaa ata cga agc tca aag gat aat gat gta aaa tat aga cgc aca 1148  
Lys Glu Ile Arg Ser Ser Lys Asp Asn Asp Val Lys Tyr Arg Arg Thr  
135 140 145

acc gca agc gga cac gcc agt act gca gtg gga gcc atg tca tat gca 1196  
Thr Ala Ser Gly His Ala Ser Thr Ala Val Gly Ala Met Ser Tyr Ala  
150 155 160

cag ggt cat ttt tcc aac gcc ttt ggt aca cgg gca aca gct aaa agt 1244  
Gln Gly His Phe Ser Ser Asn Ala Phe Gly Thr Arg Ala Thr Ala Lys Ser  
165 170 175





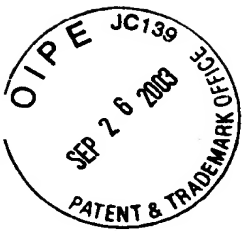
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2D

gcc tat tcc ttg gca gtg ggt ctt gcc gcc aca gcc gag ggc caa tct Ala Tyr Ser Leu Ala Val Gly Leu Ala Ala Thr Ala Glu Gly Gln Ser 180 185 190 195	1292
aca atc gct att ggt tct gat gca aca tct agc tog ttg gga ggc ata Thr Ile Ala Ile Gly Ser Asp Ala Thr Ser Ser Leu Gly Ala Ile 200 205 210	1340
gcc ctt ggt gca ggt act cgt gct cag cta cag gcc agt att gcc cta Ala Leu Gly Ala Gly Thr Arg Ala Gln Leu Gln Gly Ser Ile Ala Leu 215 220 225	1388
ggt caa ggt tct gtt gtc act cag agt gat aat aat tct aga cgc gcc Gly Gln Gly Ser Val Val Thr Gln Ser Asp Asn Ser Arg Pro Ala 230 235 240	1436
tat aca cca aat acc cag gca cta gac ccc aag ttt caa gcc acc aat Tyr Thr Pro Asn Thr Gln Ala Leu Asp Pro Lys Phe Gln Ala Thr Asn 245 250 255	1484
aat acg aag ggc ggt cca ctt tcc att ggt agt aac tct atc aaa cgt Asn Thr Lys Ala Gly Pro Leu Ser Ile Gly Ser Asn Ser Ile Lys Arg 260 265 270 275	1532



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2E

1580  
aaa atc atc aat gtc ggt gca ggt gtt aat aaa acc gat gcg gtc aat  
Lys Ile Ile Asn Val Gly Ala Gly Val Asn Lys Thr Asp Ala Val Asn  
280 285 290

1628  
gtg gca cag cta gaa gcg gtg aag tgg gct aag gag cgt aga att  
Val Ala Gln Leu Glu Ala Val Lys Trp Ala Lys Glu Arg Arg Ile  
295 300 305

1676  
act ttt cag ggt gat gat aac agt act gac gta aaa ata ggt ttg gat  
Thr Phe Gln Gly Asp Asp Asn Ser Thr Asp Val Lys Ile Gly Leu Asp  
310 315 320

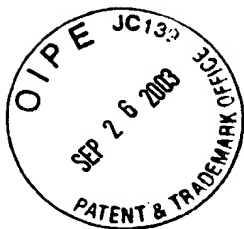
1724  
aat act tta act att aaa ggt ggt gca gag acc aac gca tta acc gat  
Asn Thr Leu Thr Ile Lys Gly Gly Ala Glu Thr Asn Ala Leu Thr Asp  
325 330 335

1772  
aat aat atc ggt gtg gta aaa gag gct gat aat agt ggt ctg aaa gtt  
Asn Asn Ile Gly Val Val Lys Glu Ala Asp Asn Ser Gly Leu Lys Val  
340 345 350 355

1820  
aaa ctt gct aaa act tta aac aat ctt act gag gtg aat aca act aca  
Lys Leu Ala Lys Thr Leu Asn Asn Leu Thr Glu Val Asn Thr Thr Thr  
360 365 370

FIG.2F

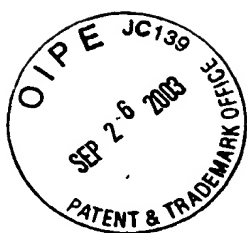
tta aat gcc aca acc aca gtt aag gta ggt agt agt agt act aca	1868
Leu Asn Ala Thr Thr Thr Val Lys Val Gly Ser Ser Thr Thr	
375 380 385	
gct gaa tta ttg agt gat agt tta acc ttt acc cag ccc aat aca ggc	1916
Ala Glu Leu Leu Ser Asp Ser Leu Thr Phe Thr Gln Pro Asn Thr Gly	
390 395 400	
agt caa agc aca agc aaa acc gtc tat ggc gtt aat ggg gtg aag ttt	1964
Ser Gln Ser Thr Ser Lys Thr Val Tyr Gly Val Asn Gly Val Lys Phe	
405 410 415	
act aat aat gca gaa aca aca gca gca atc ggc act act cgt att acc	2012
Thr Asn Asn Ala Glu Thr Thr Ala Ala Ile Gly Thr Thr Arg Ile Thr	
420 425 430 435	
aga gat aaa att ggc ttt gct cga gat ggt gat gtt gat gaa aaa caa	2060
Arg Asp Lys Ile Gly Phe Ala Arg Asp Gly Asp Val Asp Glu Lys Gln	
440 445 450	
gca cca tat ttg gat aaa aaa caa ctt aaa gtg ggt agt gtt gca att	2108
Ala Pro Tyr Leu Asp Lys Lys Gln Leu Lys Val Gly Ser Val Ala Ile	
455 460 465	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



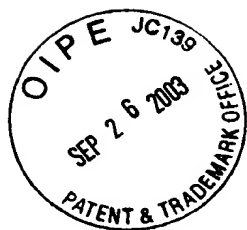
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2G

acc ata gac aat ggc att gat gca ggt aat aaa aag atc agt aat ctt	2156
Thr Ile Asp Asn Gly Ile Asp Ala Gly Asn Lys Lys Ile Ser Asn Leu	
470 475 480	
gcc aaa ggt agc agt gct aac gat gog gtt acc atc gaa cag ctc aaa	2204
Ala Lys Gly Ser Ser Ala Asn Asp Ala Val Thr Ile Glu Gln Leu Lys	
485 490 495	
gcc gcc aag cct act tta aac gca ggc gct ggc atc agt gtc aca cct	2252
Ala Ala Lys Pro Thr Leu Asn Ala Gly Ala Gly Ile Ser Val Thr Pro	
500 505 510 515	
act gaa ata tca gtt gat gct aag agt ggc aat gtt acc gcc cca act	2300
Thr Glu Ile Ser Val Asp Ala Lys Ser Gly Asn Val Thr Ala Pro Thr	
520 525 530	
tac aac att ggc gtg aaa acc acc gag ctt aac agt gat ggc act agt	2348
Tyr Asn Ile Gly Val Lys Thr Thr Glu Leu Asn Ser Asp Gly Thr Ser	
535 540 545	
gat aaa ttt agt gtt aag ggt agt ggt acg aac aat agc tta gtt acc	2396
Asp Lys Phe Ser Val Lys Gly Ser Gly Thr Asn Asn Ser Leu Val Thr	
550 555 560	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2H

gcc gaa cat ttg gca agc tat cta aat gaa gtc aat cga acg gct gac	2444
Ala Glu His Leu Ala Ser Tyr Leu Asn Glu Val Asn Arg Thr Ala Asp	
565 570 575	
agt gct cta caa agc ttt acc gtt aaa gaa gaa gac gat gat gac gcc	2492
Ser Ala Leu Gln Ser Phe Thr Val Lys Lys Glu Glu Asp Asp Ala	
580 585 590 595	
aac gct atc acc gtg gct aaa gat acg aca aaa aat gcc ggc gca gtc	2540
Asn Ala Ile Thr Val Ala Lys Asp Thr Thr Lys Asn Ala Gly Ala Val	
600 605 610	
agc atc tta aaa ctc aaa ggt aaa aac ggt cta acg gtt gct acc aaa	2588
Ser Ile Leu Lys Lys Leu Lys Gly Lys Asn Gly Leu Thr Val Ala Thr Lys	
615 620 625	
aaa gat ggt acg gtt acc ttt ggg ctt agc caa gat agc ggt ctg acc	2636
Lys Asp Gly Thr Val Thr Phe Gly Leu Ser Gln Asp Ser Gly Leu Thr	
630 635 640	
att ggc aaa agc acc cta aac aac gat ggc ttg act gtt aaa gat acc	2684
Ile Gly Lys Ser Thr Leu Asn Asn Asp Gly Leu Thr Val Lys Asp Thr	
645 650 655	



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.2I

aac gaa caa atc caa gtc ggt gct aat ggc att aaa ttt act aat gtg Asn Glu Gln Ile Gln Val Gly Ala Asn Gly Ile Lys Phe Thr Asn Val 660 665 670 675	2732
aat ggt agt aat cca ggt act ggc att gca aat acc gct cgc att acc Asn Gly Ser Asn Pro Gly Thr Gly Ile Ala Asn Thr Ala Arg Ile Thr 680 685 690	2780
aga gat aaa att ggc ttt gct ggt tct gat ggt gca gtt gat aca aac Arg Asp Lys Ile Gly Phe Ala Gly Ser Asp Gly Ala Val Asp Thr Asn 695 700 705	2828
aaa cct tat ctt gat caa gac aag cta caa gtt ggc aat gtt aag att Lys Pro Tyr Leu Asp Gln Asp Lys Leu Gln Val Gly Asn Val Lys Ile 710 715 720	2876
acc aac act ggc att aac gca ggt ggt aaa gcc atc aca ggg ctg tcc Thr Asn Thr Gly Ile Asn Ala Gly Gly Lys Ala Ile Thr Gly Leu Ser 725 730 735	2924
cca aca ctg cct agc att gcc gat caa agt agc cgc aac ata gaa ctg Pro Thr Leu Pro Ser Ile Ala Asp Gln Ser Ser Arg Asn Ile Glu Leu 740 745 750 755	2972



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2J

ggc aat aca atc caa gac aaa gac aaa tcc aac gct gcc agc att aat 3020  
Gly Asn Thr Ile Gln Asp Lys Asp Lys Ser Asn Ala Ala Ser Ile Asn  
760 765 770

gat ata tta aat aca ggc ttt aac cta aaa aat aat aac aac ccc att 3068  
Asp Ile Leu Asn Thr Gly Phe Asn Leu Lys Asn Asn Asn Pro Ile  
775 780 785

gac ttt gtc tcc act tat gac att gtt gac ttt gcc aat ggc aat gcc 3116  
Asp Phe Val Ser Thr Tyr Asp Ile Val Asp Phe Ala Asn Gly Asn Ala  
790 795 800

acc acc gcc aca gta acc cat gat acc gct aac aaa acc agt aaa gtg 3164  
Thr Thr Ala Thr Val Thr His Asp Thr Ala Asn Lys Thr Ser Lys Val  
805 810 815

gta tat gat gtg aat gtg gat gat aca acc att cat cta aca ggc act 3212  
Val Tyr Asp Val Asn Val Asp Asp Thr Thr Ile His Leu Thr Gly Thr  
820 825 830 835

gat gac aat aaa aaa ctt ggc gtc aaa acc acc aaa ctg aac aaa aca 3260  
Asp Asp Asn Lys Lys Leu Gly Val Lys Thr Thr Lys Leu Asn Lys Thr  
840 845 850



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2K

agt gct aat ggt aat aca gca act aac ttt aat gtt aac tct agt gat 3308  
Ser Ala Asn Gly Asn Thr Ala Thr Asn Phe Asn Val Asn Ser Ser Asp  
855 860 865

gaa gat gcc ctt gtt aac gcc aaa gac atc gcc gaa aat cta aac acc 3356  
Glu Asp Ala Leu Val Asn Ala Lys Asp Ile Ala Glu Asn Leu Asn Thr  
870 875 880

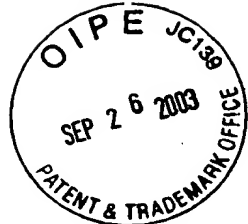
cta gcc aag gaa att cac acc acc aaa ggc aca gca gac acc gcc cta 3404  
Leu Ala Lys Glu Ile His Thr Thr Lys Gly Thr Ala Asp Thr Ala Leu  
885 890 895

caa acc ttt acc gtt aaa aag gta gat gaa aat aat aat gct gat gac 3452  
Gln Thr Phe Thr Val Lys Lys Val Asp Glu Asn Asn Asn Ala Asp Asp  
900 905 910 915

gcc aac gcc atc acc gtg ggt caa aag aac gca aat aat caa gtc aac 3500  
Ala Asn Ala Ile Thr Val Gly Gln Lys Asn Ala Asn Asn Gln Val Asn  
920 925 930

acc cta aca ctc aaa ggt gaa aac ggt ctt aat att aaa acc gac aaa 3548  
Thr Leu Thr Leu Lys Gly Glu Asn Gly Leu Asn Ile Lys Thr Asp Lys  
935 940 945





RECEIVED

OCT 02 2003

TECH CENTER 1600/29

FIG.2L

aat ggt acg gtt acc ttt ggc att aac acc aca agc ggt ctt aaa gcc 3596  
Asn Gly Thr Val Thr Phe Gly Ile Asn Thr Thr Ser Gly Leu Lys Ala  
950 955 960

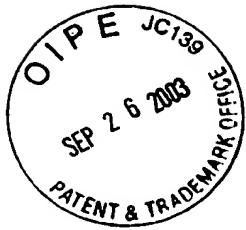
ggc aaa agc acc cta aac gac ggt ggc ttg tct att aaa aac ccc act 3644  
Gly Lys Ser Thr Leu Asn Asp Gly Gly Leu Ser Ile Lys Asn Pro Thr  
965 970 975

ggt agc gaa caa atc caa gtc ggt gct gat ggc gtg aag ttt gcc aag 3692  
Gly Ser Glu Gln Ile Gln Val Gly Ala Asp Gly Val Lys Phe Ala Lys  
980 985 990 995

gtt aat aat aat ggt gtt gta ggt gct ggc att gat ggc aca act cgc 3740  
Val Asn Asn Gly Val Val Gly Ala Gly Ile Asp Gly Thr Thr Arg  
1000 1005 1010

att acc aga gat gaa att ggc ttt act ggg act aat ggc tca ctt gat 3788  
Ile Thr Arg Asp Glu Ile Gly Phe Thr Gly Thr Asn Gly Ser Leu Asp  
1015 1020 1025

aaa agc aaa ccc cac cta agc aaa gac ggc att aac gca ggt ggt aaa 3836  
Lys Ser Lys Pro His Leu Ser Lys Asp Gly Ile Asn Ala Gly Gly Lys  
1030 1035 1040



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2M

aag att acc aac att caa tca ggt gag att gcc caa aac agc cat. gat 3884  
Lys Ile Thr Asn Ile Gln Ser Gly Glu Ile Ala Gln Asn Ser His Asp  
1045 1050 1055

gct gtg aca ggc ggc aag att tat gat tta aaa acc gaa ctt gaa aac 3932  
Ala Val Thr Gly Gly Lys Ile Tyr Asp Leu Lys Thr Glu Leu Glu Asn  
1060 1065 1070 1075

aaa atc agc agt act gcc aaa aca gca caa aac tca tta cac gaa ttc 3980  
Lys Ile Ser Ser Thr Ala Lys Thr Ala Gln Asn Ser Leu His Glu Phe  
1080 1085 1090

tca gta gca gat gaa caa ggt aat aac ttt acg gtt agt aac cct tac 4028  
Ser Val Ala Asp Glu Gln Gly Asn Asn Phe Thr Val Ser Asn Pro Tyr  
1095 1100 1105

tcc agt tat gac acc tca aag acc tct gat gtc atc acc ttt gca ggt 4076  
Ser Ser Tyr Asp Thr Ser Lys Thr Ser Asp Val Ile Thr Phe Ala Gly  
1110 1115 1120

gaa aac ggc att acc acc aag gta aat aaa ggt gtg cgt gtg ggc 4124  
Glu Asn Gly Ile Thr Thr Lys Val Asn Lys Gly Val Val Arg Val Gly  
1125 1130 1135



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2N

att gac caa acc aaa ggc tta acc aag cct aag ctg acc gtg ggt aat 4172  
Ile Asp Gln Thr Lys Gly Leu Thr Pro Lys Leu Thr Val Gly Asn  
1140 1145 1150 1155

aat aat ggc aaa ggc att gtc att gac agc caa aat ggt caa aat acc 4220  
Asn Asn Gly Lys Gly Ile Val Ile Asp Ser Gln Asn Gly Gln Asn Thr  
1160 1165 1170

atc aca gga cta agc aac act cta gct aat gtt acc aat gat aaa ggt 4268  
Ile Thr Gly Leu Ser Asn Thr Leu Ala Asn Val Thr Asn Asp Lys Gly  
1175 1180 1185

agc gta cgc acc aca gaa cag ggc aat ata atc aaa gac gaa gac aaa 4316  
Ser Val Arg Thr Thr Glu Gln Gly Asn Ile Ile Lys Asp Glu Asp Lys  
1190 1195 1200

acc cgt gcc gcc agc att gtt gat gtg cta agc gca ggc ttt aac ttg 4364  
Thr Arg Ala Ala Ser Ile Val Asp Val Leu Ser Ala Gly Phe Asn Leu  
1205 1210 1215

caa ggc aat ggt gaa gcg gtt gac ttt gtc tcc act tat gac acc gtc 4412  
Gln Gly Asn Gly Glu Ala Val Asp Phe Val Ser Thr Tyr Asp Thr Val  
1220 1225 1230 1235



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.20

4460  
aac ttt gcc gat ggc aat gcc acc acc gct aag gtg acc tat gat gac  
Asn Phe Ala Asp Gly Asn Ala Thr Thr Ala Lys Val Thr Tyr Asp Asp  
1240 1245 1250

4508  
aca agc aaa acc agt aaa gtg gtc tat gat gtc aat gtg gat gat aca  
Thr Ser Lys Thr Ser Lys Val Val Tyr Asp Val Asn Val Asp Asp Thr  
1255 1260 1265

4556  
acc att gaa gtt aaa gat aaa aaa ctt ggc gta aaa acc acc aca ttg  
Thr Ile Glu Val Lys Asp Lys Lys Leu Gly Val Lys Thr Thr Thr Leu  
1270 1275 1280

4604  
acc agt act ggc aca ggt gct aat aaa ttt gcc cta agc aat caa gct  
Thr Ser Thr Gly Thr Gly Ala Asn Lys Phe Ala Leu Ser Asn Gln Ala  
1285 1290 1295

4652  
act ggc gat gog ctt gtc aag gcc agt gat atc gtt gct cat cta aac  
Thr Gly Asp Ala Leu Val Lys Ala Ser Asp Ile Val Ala His Leu Asn  
1300 1305 1310 1315

4700  
acc tta tct ggc gac atc caa act gcc aaa ggc gca agc caa gcg aac  
Thr Leu Ser Gly Asp Ile Gln Thr Ala Lys Gly Ala Ser Gln Ala Asn  
1320 1325 1330



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2P

4748  
aac tca gca ggc tat gtg gat gct gat ggc aat aag gtc atc tat gac  
Asn Ser Ala Gly Tyr Val Asp Ala Asp Gly Asn Lys Val Ile Tyr Asp  
1335 1340 1345

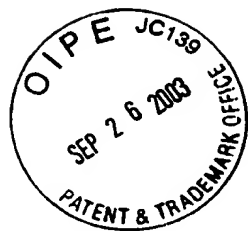
4796  
agt acc gat aac aag tac tat caa gcc aaa aat gat ggc aca gtt gat  
Ser Thr Asp Asn Lys Tyr Tyr Gln Ala Lys Asn Asp Gly Thr Val Asp  
1350 1355 1360

4844  
aaa acc aaa gaa gtt gcc aaa gac aaa ctg gtc gcc caa gcc caa acc  
Lys Thr Lys Lys Glu Val Ala Lys Asp Lys Leu Val Ala Gln Ala Gln Thr  
1365 1370 1375

4892  
cca gat ggc aca ttg gct caa atg aat gtc aaa tca gtc att aac aaa  
Pro Asp Gly Thr Leu Ala Gln Met Asn Val Lys Ser Val Ile Asn Lys  
1380 1385 1390 1395

4940  
gaa caa gta aat gat gcc aat aaa aag caa ggc atc aat gaa gac aac  
Glu Gln Val Asn Asp Ala Asn Lys Lys Gln Gly Ile Asn Glu Asp Asn  
1400 1405 1410

4988  
gcc ttt gtt aaa gga ctt gaa aaa gcc gct tct gat aac aaa acc aaa  
Ala Phe Val Lys Gly Leu Glu Lys Lys Ala Ala Ser Asp Asn Lys Thr Lys  
1415 1420 1425



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2Q

5036  
aac gcc gca gta act gtg ggt gat tta aat gcc gtt gcc caa aca ccg  
Asn Ala Ala Val Thr Val Gly Asp Leu Asn Ala Val Ala Gln Thr Pro  
1430 1435 1440

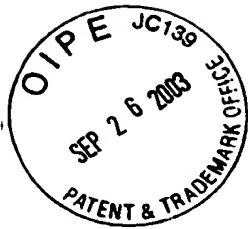
5084  
ctg acc ttt gca ggg gat aca ggc aca acg gct aaa aaa ctg ggc gag  
Leu Thr Phe Ala Gly Asp Thr Gly Thr Thr Ala Lys Lys Leu Gly Glu  
1445 1450 1455

5132  
act ttg acc atc aaa ggt ggg caa aca gac acc aat aag cta acc gat  
Thr Leu Thr Ile Lys Gly Gly Gln Thr Asp Thr Asn Lys Leu Thr Asp  
1460 1465 1470 1475

5180  
aat aac atc ggt gtg gta gca ggt act gat ggc ttc act gtc aaa ctt  
Asn Asn Ile Gly Val Val Ala Gly Thr Asp Gly Phe Thr Val Lys Leu  
1480 1485 1490

5228  
gcc aaa gac cta acc aat ctt aac agc gtt aat gca ggt ggc acc aaa  
Ala Lys Asp Leu Thr Asn Leu Asn Ser Val Asn Ala Gly Gly Thr Lys  
1495 1500 1505

5276  
att gat gac aaa ggc gtg tct ttt gta gac tca agc ggt caa gcc aaa  
Ile Asp Asp Lys Gly Val Ser Phe Val Asp Ser Ser Gly Gln Ala Lys  
1510 1515 1520



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

## FIG.2R

gca aac acc cct gtg cta agt gcc aat ggg ctg gac ctg ggt ggc aag 5324  
Ala Asn Thr Pro Val Leu Ser Ala Asn Gly Leu Asp Leu Gly Gly Lys  
1525 1530 1535

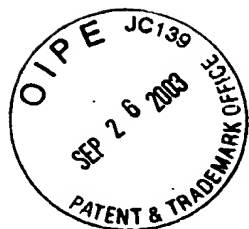
gtc atc agt aat gtg ggc aaa ggc aca aaa gat acc gac gct gcc aat 5372  
Val Ile Ser Asn Val Gly Lys Gly Thr Lys Asp Thr Asp Ala Ala Asn  
1540 1545 1550 1555

gta caa cag tta aac gaa gta cgc aac ttg ttg ggt ctt ggt aat gct 5420  
Val Gln Gln Leu Asn Glu Val Arg Asn Leu Gly Leu Gly Asn Ala  
1560 1565 1570

ggt aat gat aac gct gac ggc aat cag gta aac att gcc gac atc aaa 5468  
Gly Asn Asp Asn Ala Asp Gly Asn Gln Val Asn Ile Ala Asp Ile Lys  
1575 1580 1585

aaa gac cca aat tca ggt tca tca tct aac cgc act gtc atc aaa gca 5516  
Lys Asp Pro Asn Ser Gly Ser Ser Asn Arg Thr Val Ile Lys Ala  
1590 1595 1600

ggc aag gta ctt ggc ggt aaa ggt aat aac gat acc gaa aaa ctt gcc 5564  
Gly Thr Val Leu Gly Gly Lys Gly Asn Asn Asp Thr Glu Lys Leu Ala  
1605 1610 1615



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2S

act ggt ggt ata caa gtg ggc ggc gat aaa gac ggc aac gct aac ggc 5612  
Thr Gly Gly Ile Gln Val Gly Val Asp Lys Asp Gly Asn Ala Asn Gly  
1620 1625 1630 1635

gat tta agc aat gtt tgg gtc aaa acc caa aaa gat ggc agc aaa aaa 5660  
Asp Leu Ser Asn Val Trp Val Lys Thr Gln Lys Asp Gly Ser Lys Lys  
1640 1645 1650

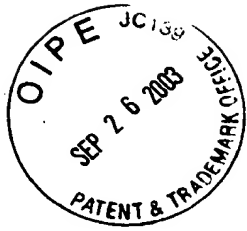
gcc ctg ctc gcc act tat aac gcc gca ggt cag acc aac tat ttg acc 5708  
Ala Leu Leu Ala Thr Tyr Asn Ala Ala Gly Gln Thr Asn Tyr Leu Thr  
1655 1660 1665

aac aac ccc gca gaa gcc att gac aga ata aat gaa caa ggt atc cgc 5756  
Asn Asn Pro Ala Glu Ala Ile Asp Arg Ile Asn Glu Gln Gly Ile Arg  
1670 1675 1680

ttc ttc cat gtc aac gat ggc aat caa gag cct gtg gta caa ggg cgt 5804  
Phe Phe His Val Asn Asp Gly Asn Gln Glu Pro Val Val Gln Gly Arg  
1685 1690 1695

aac ggc att gac tca agt gcc tca ggc aag cac tca gtg gcg ata ggt 5852  
Asn Gly Ile Asp Ser Ser Ala Ser Gly Lys His Ser Val Ala Ile Gly  
1700 1705 1710 1715





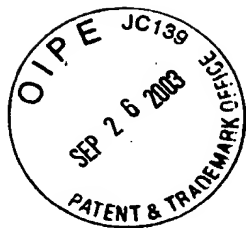
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.2T

ttc cag gcc aag gca gat ggt gaa gcc gcc gtt gcc ata ggc aga caa Phe Gln Ala Lys Ala Asp Gly Glu Ala Ala Val Ala Ile Gly Arg Gln 1720 1725 1730	5900
acc caa gca ggc aac caa tcc atc gcc atc ggt gat aac gca caa gcc Thr Gln Ala Gly Asn Gln Ser Ile Ala Ile Gly Asp Asn Ala Gln Ala 1735 1740 1745	5948
acg ggc gat caa tcc atc gcc atc ggt aca ggc aat gtg gta gca ggt Thr Gly Asp Gln Ser Ile Ala Ile Gly Thr Gly Asn Val Val Ala Gly 1750 1755 1760	5996
aag cac tct ggt gcc atc ggc gac cca agc act gtt aag gct gat aac Lys His Ser Gly Ala Ile Gly Asp Pro Ser Thr Val Lys Ala Asp Asn 1765 1770 1775	6044
agt tac agt gtg ggt aat aac aac cag ttt acc gat gcc act caa acc Ser Tyr Ser Val Gly Asn Asn Gln Phe Thr Asp Ala Thr Gln Thr 1780 1785 1790 1795	6092
gat gtc ttt ggt gtg ggc aat aac atc acc gtg acc gaa agt aac tgg Asp Val Phe Gly Val Gly Asn Asn Ile Thr Val Thr Glu Ser Asn Ser 1800 1805 1810	6140



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2U

gtt gcc tta ggt tca aac tct gcc atc agt gca ggc aca cac gca ggc 6188  
Val Ala Leu Gly Ser Asn Ser Ala Ile Ser Ala Gly Thr His Ala Gly 1815 1820 1825

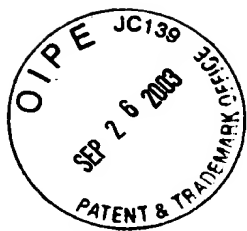
aca caa gcc aaa aaa tct gac ggc aca gca ggt aca acc acc aca gca 6236  
Thr Gln Ala Lys Lys Ser Asp Gly Thr Ala Gly Thr Thr Thr Ala 1830 1835 1840

ggt gca acc ggt acg gtt aaa ggc ttt gct gga caa acg gcg gtt ggt 6284  
Gly Ala Thr Gly Thr Val Lys Gly Phe Ala Gly Gln Thr Ala Val Gly 1845 1850 1855

gcg gtc tcc gtg ggt gcc tca ggt gct gaa cgc cgt atc caa aat gtg 6332  
Ala Val Ser Val Gly Ala Ser Gly Ala Glu Arg Arg Ile Gln Asn Val 1860 1865 1870 1875

gca gca ggt gag gtc agt gcc acc agc acc gat gcg gtc aat ggt agc 6380  
Ala Ala Gly Glu Val Ser Ala Thr Ser Thr Asp Ala Val Asn Gly Ser 1880 1885 1890

cag ttg tac aaa gcc acc caa agc att gcc aac gca acc aat gag ctt 6428  
Gln Leu Tyr Lys Ala Thr Gln Ser Ile Ala Asn Ala Thr Asn Glu Leu 1895 1900 1905



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2V

gac cat cgt atc cac caa aac gaa aat aag gcc aat gca ggg att tca 6476  
Asp His Arg Ile His Gln Asn Glu Asn Lys Ala Asn Ala Gly Ile Ser  
1910 1915 1920

tca gog atg gog atg gog tcc atg cca caa gcc tac att cct ggc aga 6524  
Ser Ala Met Ala Met Ala Ser Met Pro Gln Ala Tyr Ile Pro Gly Arg  
1925 1930 1935

tcc atg gtt acc ggg ggt att gcc acc cac aac ggt caa ggt gog gtg 6572  
Ser Met Val Thr Gly Gly Ile Ala Thr His Asn Gly Gln Gly Ala Val  
1940 1945 1950 1955

gca gtg gga ctg tog aag ctg tog gat aat ggt caa tgg gta ttt aaa 6620  
Ala Val Gly Leu Ser Lys Leu Ser Asp Asn Gly Gln Trp Val Phe Lys  
1960 1965 1970

atc aat ggt tca gcc gat acc caa ggc cat gta ggg gog gca gtt ggt 6668  
Ile Asn Gly Ser Ala Asp Thr Gln Gly His Val Gly Ala Ala Val Gly  
1975 1980 1985

gca ggt ttt cac ttt taagccataa atogcaagat ttactttaa aatcaatctc 6723  
Ala Gly Phe His Phe  
1990



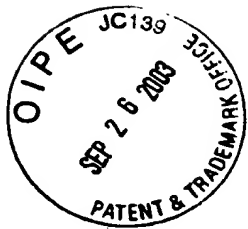
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.2W

accatagttg tataaaacag catcagcatc agtcatatta ctgatgctga tgttttttat 6783  
cacttaaacc attttacogc tcaagtgatt ctctttcacc atgacccaaat cgcatttgat 6843  
cataggtaaa cttattgagt aaattttatc aatgtagttg ttagatatgg ttaaaattgt 6903  
gccattgacc aaaaaatgac cgatttatcc cgaaaatttc tgattatgat cgttgacct 6963  
gcaggtcgac 6973



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

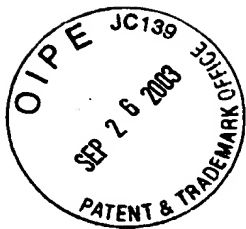
# FIG.3A

*M. catarrhalis* strain 4223 genomic 200kDa gene.

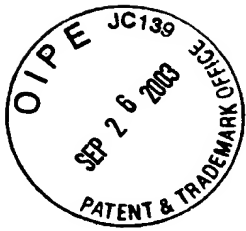
ccatggatat gggcagggtgt gctgcgcctgc cgtatgatgg cgatgacacc ccatttgccc 60  
catatctgta cgatttgaca tgtgatatga tttaacatgt gacatgattt aacattgttt 120  
aatactgttg ccatcattac cataattttag taacgcattt agtaaacgat ttgtaaaaat 180  
cattgcgccc ctttatgtgt atcatatgaa tagaatatta tgattgtatc tgattattgt 240  
atcagaatgg tgatgctata tgatgatgcc taagagtga ttggggttaa tcaactctatg 300  
atttgatata ttttgaaact aatctattga cttaaatcac catatgggta taatttagca 360  
taatggtagg ctttttgtaa aaatcacatc gcaatatgtt tctactgtta ctaccatgct 420  
tgaatgacga tccaatcac cagattcatt caagtgatgt gttgtatac gcaccattta 480  
ccctaattat ttcaatcaaa tgccatgtc agcatgtatc atttttttaa ggtaaacccac 540  
c atg aat cac atc tat aaa gtc atc ttt aac aaa gcc aca ggc aca ttt 589  
Met Asn His Ile Tyr Lys Val Ile Phe Asn Lys Ala Thr Gly Thr Phe  
1 5 10 15

FIG.3B

atg gca gtg gca gag tac gcc aaa tcc cac agc agc ggg ggg ggt agc	637
Met Ala Val Ala Glu Tyr Ala Lys Ser His Ser Thr Gly Gly Gly Ser	20 25 30
tgt gct aca ggg caa gtt ggc agt gta tgc act ctg agc ttt gcc cgt	685
Cys Ala Thr Gly Gln Val Gly Ser Val Cys Thr Leu Ser Phe Ala Arg	35 40 45
att gcc gcg ctc gct gtc ctc <span style="border: 1px solid black;">gtg</span> atc ggt gca acg ctc agt ggc agt	733
Ile Ala Ala Leu Ala Val Leu Val Ile Gly Ala Thr Leu Ser Gly Ser	50 55 60
gct tat gct caa aaa gat acc aaa cat atc gca att ggt gaa caa	781
Ala Tyr Ala Gln Lys Lys Asp Thr Lys His Ile Ala Ile Gly Glu Gln	65 70 75 80
aac cag cca aga cgc tca ggc act gcc aag gcg gac ggt gat cga gcc	829
Asn Gln Pro Arg Arg Ser Gly Thr Ala Lys Ala Asp Gly Asp Arg Ala	85 90 95
att gct att ggt gaa aat gct aac gca cag ggc ggt caa gcc atc gcc	877
Ile Ala Ile Gly Glu Asn Ala Asn Ala Gln Gly Gly Gln Ala Ile Ala	100 105 110



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3C

atc ggt agt agt aat aaa act gtc aat gga agc agt ttg gat aag ata 925  
Ile Gly Ser Ser Asn Lys Thr Val Asn Gly Ser Ser Leu Asp Lys Ile  
115 120 125

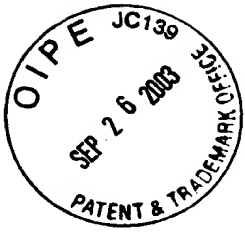
ggt acc gat gct acg ggt caa gag tcc atc gcc atc ggt ggt gat gta 973  
Gly Thr Asp Ala Thr Gly Gln Glu Ser Ile Ala Ile Gly Gly Asp Val  
130 135 140

aag gct agt ggt gat gcc tog att gcc atc ggt agt gat gac tta cat 1021  
Lys Ala Ser Gly Asp Ala Ser Ile Ala Ile Gly Ser Asp Asp Leu His  
145 150 155 160

ttg ctt gat cag cat ggt aat cct aaa cat cag aaa ggt act ctg att 1069  
Leu Leu Asp Gln His Gly Asn Pro Lys His Pro Lys Gly Thr Leu Ile  
165 170 175

aac gat ctt att aac ggc cat gca gta tta aaa gaa ata cga agc tca 1117  
Asn Asp Leu Ile Asn Gly His Ala Val Leu Lys Glu Ile Arg Ser Ser  
180 185 190

aag gat aat gat gta aaa tat aga cgc aca acc gca agc gga cac gcc 1165  
Lys Asp Asn Asp Val Lys Tyr Arg Arg Thr Thr Ala Ser Gly His Ala  
195 200 205



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

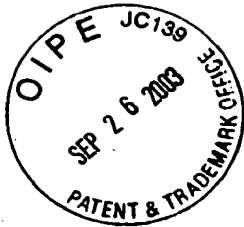
FIG.3D

1213	agt act gca gtg gga gcc atg tca tat gca cag ggt cat ttt tcc aac	
	Ser Thr Ala Val Gly Ala Met Ser Tyr Ala Gln Gly His Phe Ser Asn	
210	215	220
1261	gcc ttt ggt aca cgg gca aca gct aaa agt gcc tat tcc ttg gca gtg	
	Ala Phe Gly Thr Arg Ala Thr Ala Lys Ser Ala Tyr Ser Leu Ala Val	
225	230	235
	240	
1309	ggt ctt gcc gcc aca gcc gag ggc caa tct aca atc gct att ggt tct	
	Gly Leu Ala Ala Thr Ala Glu Gly Gln Ser Thr Ile Ala Ile Gly Ser	
	245	250
		255
1357	gat gca aca tct agc tcg ttg gga gog ata gcc ctt ggt gca ggt act	
	Asp Ala Thr Ser Ser Ser Leu Gly Ala Ile Ala Leu Gly Ala Gly Thr	
	260	265
		270
1405	cgt gct cag cta cag ggc agt att gcc cta ggt caa ggt tct gtt gtc	
	Arg Ala Gln Leu Gln Gly Ser Ile Ala Leu Gly Gln Gly Ser Val Val	
	275	280
		285
1453	act cag agt gat aat aat tct aga cgg gcc tat aca cca aat acc cag	
	Thr Gln Ser Asp Asn Asn Ser Arg Pro Ala Tyr Thr Pro Asn Thr Gln	
	290	295
		300



FIG.3E

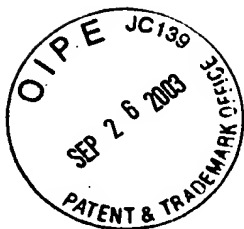
gca cta gac ccc aag ttt caa gcc acc aat aat acg aag gog ggt cca Ala Leu Asp Pro Lys Phe Gln Ala Thr Asn Asn Thr Lys Ala Gly Pro 305 310 315 320	1501
ctt toc att ggt agt aac tct atc aaa cgt aaa atc atc aat gtc ggt Leu Ser Ile Gly Ser Asn Ser Ile Lys Arg Lys Ile Ile Asn Val Gly 325 330 335	1549
gca ggt gtt aat aaa acc gat gog gtc aat gtg gca cag cta gaa gog Ala Gly Val Asn Lys Thr Asp Ala Val Asn Val Ala Gln Leu Glu Ala 340 345 350	1597
gtg gtg aag tgg gct aag gag cgt aga att act ttt cag ggt gat gat Val Val Lys Trp Ala Lys Glu Arg Arg Ile Thr Phe Gln Gly Asp Asp 355 360 365	1645
aac agt act gac gta aaa ata ggt ttg gat aat act tta act att aaa Asn Ser Thr Asp Val Lys Ile Gly Leu Asp Asn Thr Leu Thr Ile Lys 370 375 380	1693
ggt ggt gca gag acc aac gca tta acc gat aat aat atc ggt gtg gta Gly Gly Ala Glu Thr Asn Ala Leu Thr Asp Asn Asn Ile Gly Val Val 385 390 395 400	1741



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3F

aaa gag gct gat aat agt ggt ctg aaa gtt aaa ctt gct aaa act tta 1789  
Lys Glu Ala Asp Asn Ser Gly Leu Lys Val Lys Leu Ala Lys Thr Leu 415  
405 410

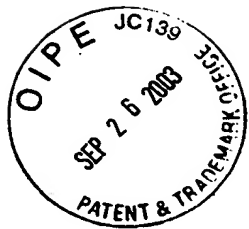
aac aat ctt act gag gtg aat aca act aca tta aat gcc aca acc aca 1837  
Asn Asn Leu Thr Glu Val Asn Thr Thr Leu Asn Ala Thr Thr Thr 430  
420 425

gtt aag gta ggt agt agt agt act aca gct gaa tta ttg agt gat 1885  
Val Lys Val Gly Ser Ser Ser Thr Thr Ala Glu Leu Leu Ser Asp 445  
435 440

agt tta acc ttt acc cag ccc aat aca ggc agt caa agc aca agc aaa 1933  
Ser Leu Thr Phe Thr Gln Pro Asn Thr Gly Ser Gln Ser Thr Ser Lys 460  
450 455

acc gtc tat ggc gtt aat ggg gtg aag ttt act aat aat gca gaa aca 1981  
Thr Val Tyr Gly Val Asn Gly Val Lys Phe Thr Asn Asn Ala Glu Thr 480  
465 470 475

aca gca gca atc ggc act act ogt att acc aga gat aaa att ggc ttt 2029  
Thr Ala Ala Ile Gly Thr Thr Arg Ile Thr Arg Asp Lys Ile Gly Phe 495  
485 490



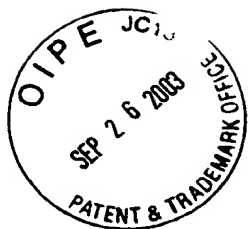
RECEIVED

OCT 02 2003

TECH CENTER 1600/2901

FIG.3G

gct cga gat ggt gat gtt gat gaa aaa caa gca cca tat ttg gat aaa	2077
Ala Arg Asp Gly Asp Val Asp Glu Lys Gln Ala Pro Tyr Leu Asp Lys	500 505 510
aaa caa ctt aaa gtg ggt agt gtt gca att acc ata gac aat ggc att	2125
Lys Gln Leu Lys Val Gly Ser Val Ala Ile Thr Ile Asp Asn Gly Ile	515 520 525
gat gca ggt aat aaa aag atc agt aat ctt gcc aaa ggt agc agt gct	2173
Asp Ala Gly Asn Lys Lys Ile Ser Asn Leu Ala Lys Gly Ser Ser Ala	530 535 540
aac gat gog gtt acc atc gaa cag ctc aaa gcc gcc aag cct act tta	2221
Asn Asp Ala Val Thr Ile Glu Lys Leu Lys Ala Ala Lys Pro Thr Leu	545 550 555 560
aac gca ggc gct ggc atc agt gtc aca cct act gaa ata tca gtt gat	2269
Asn Ala Gly Ala Gly Ile Ser Val Thr Pro Thr Glu Ile Ser Val Asp	565 570 575
gct aag agt ggc aat gtt acc gcc cca act tac aac att ggc gtg aaa	2317
Ala Lys Ser Gly Asn Val Thr Ala Pro Thr Tyr Asn Ile Gly Val Lys	580 585 590



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3H

acc acc gag ctt aac agt gat ggc act agt gat aaa ttt agt gtt aag 2365  
Thr Thr Glu Leu Asn Ser Asp Gly Thr Ser Asp Lys Phe Ser Val Lys  
595 600 605

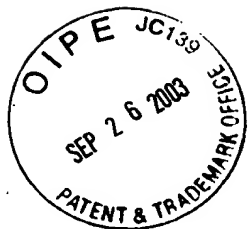
ggt agt ggt acg aac aat agc tta gtt acc gcc gaa cat ttg gca agc 2413  
Gly Ser Gly Thr Asn Asn Ser Leu Val Thr Ala Glu His Leu Ala Ser  
610 615 620

tat cta aat gaa gtc aat oga acg gct gac agt gct cta caa agc ttt 2461  
Tyr Leu Asn Glu Val Asn Arg Thr Ala Asp Ser Ala Leu Gln Ser Phe  
625 630 635 640

acc gtt aaa gaa gac gat gat gac gcc aac gct atc acc gtg gct 2509  
Thr Val Lys Glu Glu Asp Asp Asp Ala Asn Ala Ile Thr Val Ala  
645 650 655

aaa gat acg aca aaa aat gcc ggc gca gtc agc atc tta aaa ctc aaa 2557  
Lys Asp Thr Thr Lys Asn Ala Gly Ala Val Ser Ile Leu Lys Leu Lys  
660 665 670

ggt aaa aac ggt cta acg gtt gct acc aaa aac gat ggt acg gtt acc 2605  
Gly Lys Asn Gly Leu Thr Val Ala Thr Lys Lys Asp Gly Thr Val Thr  
675 680 685



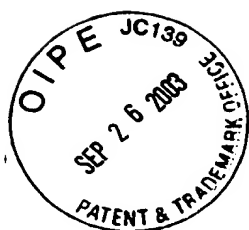
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3I

ttt ggg ctt agc caa gat agc ggt ctg acc att ggc aaa agc acc cta Phe Gly Leu Ser Gln Asp Ser Gly Leu Thr Ile Gly Lys Ser Thr Leu 690 700 2653
aac aac gat ggc ttg act gtt aaa gat acc aac gaa caa atc caa gtc Asn Asn Asp Gly Leu Thr Val Lys Asp Thr Asn Glu Gln Ile Gln Val 705 710 715 720 2701
ggt gct aat ggc att aaa ttt act aat gtg aat ggt agt aat cca ggt Gly Ala Asn Gly Ile Lys Phe Thr Asn Val Asn Gly Ser Asn Pro Gly 725 730 735 2749
act ggc att gca aat acc gct ogc att acc aga gat aaa att ggc ttt Thr Gly Ile Ala Asn Thr Ala Arg Ile Thr Arg Asp Lys Ile Gly Phe 740 745 750 2797
gct ggt tct gat ggt gca gtt gat aca aac aaa cct tat ctt gat caa Ala Gly Ser Asp Gly Ala Val Asp Thr Asn Lys Pro Tyr Leu Asp Gln 755 760 765 2845
gac aag cta caa gtt ggc aat gtt aag att acc aac act ggc att aac Asp Lys Leu Gln Val Gly Asn Val Lys Ile Thr Asn Thr Gly Ile Asn 770 775 780 2893



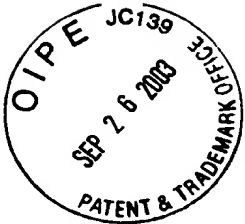
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3J

gca ggt ggt aaa gcc atc aca ggg ctg tcc cca aca ctg cct agc att Ala Gly Gly Lys Ala Ile Thr Gly Leu Ser Pro Thr Leu Pro Ser Ile 785 790 795 800	2941
gcc gat caa agt agc ogc aac ata gaa ctg ggc aat aca atc caa gac Ala Asp Gln Ser Ser Arg Asn Ile Glu Leu Gly Asn Thr Ile Gln Asp 805 810 815	2989
aaa gac aaa tcc aac gct gcc agc att aat gat ata tta aat aca ggc Lys Asp Lys Ser Asn Ala Ala Ser Ile Asn Asp Ile Leu Asn Thr Gly 820 825 830	3037
ttt aac cta aaa aat aat aac aac ccc att gac ttt gtc tcc act tat Phe Asn Leu Lys Asn Asn Asn Asn Pro Ile Asp Phe Val Ser Thr Tyr 835 840 845	3085
gac att gtt gac ttt gcc aat ggc aat gcc acc gcc acc gta acc Asp Ile Val Asp Phe Ala Asn Gly Asn Ala Thr Thr Ala Thr Val Thr 850 855 860	3133
cat gat acc gct aac aaa acc agt aaa gtg gta tat gat gtg aat gtg His Asp Thr Ala Asn Lys Thr Ser Lys Val Val Tyr Asp Val Asn Val 865 870 875 880	3181



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3K

gat gat aca acc att cat cta aca ggc act gat gac aat aaa aaa ctt 3229  
Asp Asp Thr Thr Ile His Leu Thr Gly Thr Asp Asp Asn Lys Lys Leu 885 890 895

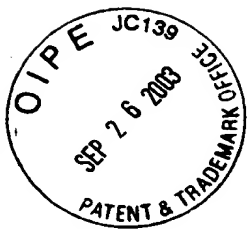
ggc gtc aaa acc acc aaa ctg aac aaa aca agt gct aat ggt aat aca 3277  
Gly Val Lys Thr Thr Lys Leu Asn Lys Thr Ser Ala Asn Gly Asn Thr 900 905 910

gca act aac ttt aat gtt aac tct agt gat gaa gat gcc ctt gtt aac 3325  
Ala Thr Asn Phe Asn Val Asn Ser Ser Asp Glu Asp Ala Leu Val Asn 915 920 925

gcc aaa gac atc gcc gaa aat cta aac acc cta gcc aag gaa att cac 3373  
Ala Lys Asp Ile Ala Glu Asn Leu Asn Thr Leu Ala Lys Glu Ile His 930 935 940

acc acc aaa ggc aca gca gac acc gcc cta caa acc ttt acc gtt aaa 3421  
Thr Thr Lys Gly Thr Ala Asp Thr Ala Leu Gln Thr Phe Thr Val Lys 945 950 955 960

aag gta gat gaa aat aat gct gat gac gcc aac gcc atc acc acc gtg 3469  
Lys Val Asp Glu Asn Asn Ala Asp Asp Ala Asn Ala Ile Thr Val 965 970 975



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3L

ggt caa aag aac gca aat aat caa gtc aac acc cta aca ctc aaa ggt 3517  
Gly Gln Lys Asn Ala Asn Asn Gln Val Asn Thr Leu Thr Leu Lys Gly  
980 985 990

gaa aac ggt ctt aat att aaa acc gac aaa aat ggt acg gtt acc ttt 3565  
Glu Asn Gly Leu Asn Ile Lys Thr Asp Lys Asn Gly Thr Val Thr Phe  
995 1000 1005

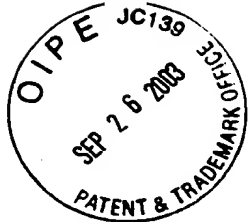
ggc att aac acc aca agc ggt ctt aaa gcc ggc aaa agc acc cta aac 3613  
Gly Ile Asn Thr Thr Ser Gly Leu Lys Ala Gly Lys Ser Thr Leu Asn  
1010 1015 1020

gac ggt ggc ttg tct att aaa aac ccc act ggt agc gaa caa atc caa 3661  
Asp Gly Gly Leu Ser Ile Lys Asn Pro Thr Gly Ser Glu Gln Ile Gln  
1025 1030 1035 1040

gtc ggt gct gat ggc gtg aag ttt gcc aag gtt aat aat ggt gtt 3709  
Val Gly Ala Asp Gly Val Lys Phe Ala Lys Val Asn Asn Asn Gly Val  
1045 1050 1055

gta ggt gct ggc att gat ggc aca act cgc att acc aga gat gaa att 3757  
Val Gly Ala Gly Ile Asp Gly Thr Thr Arg Ile Thr Arg Asp Glu Ile  
1060 1065 1070





RECEIVED

OCT 02 2003

TECH CENTER 1600/290

## FIG.3M

ggc ttt act ggg act aat ggc tca ctt gat aaa agc aaa ccc cac cta 3805  
Gly Phe Thr Gly Thr Asn Gly Ser Leu Asp Lys Ser Lys Pro His Leu  
1075 1080 1085

agc aaa gac ggc att aac gca ggt ggt aaa aag att acc aac att caa 3853  
Ser Lys Asp Gly Ile Asn Ala Gly Gly Lys Ile Thr Asn Ile Gln  
1090 1095 1100

tca ggt gag att gcc caa aac agc cat gat gct gtg aca ggc ggc aag 3901  
Ser Gly Glu Ile Ala Gln Asn Ser His Asp Ala Val Thr Gly Gly Lys  
1105 1110 1115 1120

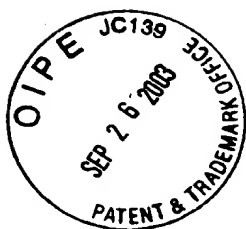
att tat gat tta aaa acc gaa ctt gaa aac aaa atc agc agt act gcc 3949  
Ile Tyr Asp Leu Lys Thr Glu Leu Glu Asn Lys Ile Ser Ser Thr Ala  
1125 1130 1135

aaa aca gca caa aac tca tta cac gaa ttc tca gta gca gat gaa caa 3997  
Lys Thr Ala Gln Asn Ser Leu His Glu Phe Ser Val Ala Asp Glu Gln  
1140 1145 1150

ggt aat aac ttt acg gtt agt aac cct tac tcc agt tat gac acc tca 4045  
Gly Asn Asn Phe Thr Val Ser Asn Pro Tyr Ser Ser Tyr Asp Thr Ser  
1155 1160 1165

FIG.3N

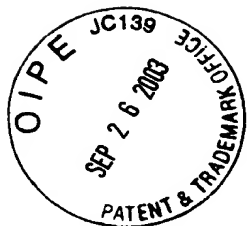
aag acc tct gat gtc atc acc ttt gca ggt gaa aac ggc att acc acc Lys Thr Ser Asp Val Ile Thr Phe Ala Gly Glu Asn Gly Ile Thr Thr	1170 1175 1180	4093
aag gta aat aaa ggt gtg gtg ogt gtg ggc att gac caa acc aaa ggc Lys Val Asn Lys Gly Val Val Arg Val Gly Ile Asp Gln Thr Lys Gly	1185 1190 1195 1200	4141
tta acc acg cct aag ctg acc gtg ggt aat aat ggc aaa ggc att Leu Thr Thr Pro Lys Leu Thr Val Gly Asn Asn Asn Gly Lys Gly Ile	1205 1210 1215	4189
gtc att gac agc caa aat ggt caa aat acc atc aca gga cta agc aac Val Ile Asp Ser Gln Asn Gly Gln Asn Thr Ile Thr Gly Leu Ser Asn	1220 1225 1230	4237
act cta gct aat gtt acc aat gat aaa ggt agc gta cgc acc aca gaa Thr Leu Ala Asn Val Thr Asn Asp Lys Gly Ser Val Arg Thr Thr Glu	1235 1240 1245	4285
cag ggc aat ata atc aaa gac gaa gac aaa acc cgt gcc gcc agc att Gln Gly Asn Ile Ile Lys Asp Glu Asp Lys Thr Arg Ala Ala Ser Ile	1250 1255 1260	4333



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.30

gtt gat gtg cta agc gca ggc ttt aac ttg caa ggc aat ggt gaa gog 4381  
Val Asp Val Leu Ser Ala Gly Phe Asn Leu Gln Gly Asn Gly Glu Ala 1280  
1265 1270 1275

gtt gac ttt gtc tcc act tat gac acc gtc aac ttt gcc gat ggc aat 4429  
Val Asp Phe Val Ser Thr Tyr Asp Thr Val Asn Phe Ala Asp Gly Asn 1295  
1285 1290

gcc acc acc gct aag gtg acc tat gat gac aca agc aaa acc agt aaa 4477  
Ala Thr Thr Ala Lys Val Thr Tyr Asp Asp Thr Ser Lys Thr Ser Lys 1310  
1300 1305

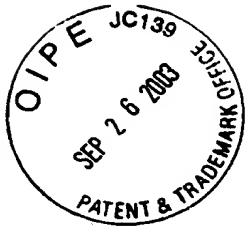
gtg gtc tat gat gtc aat gtg gat gat aca acc att gaa gtt aaa gat 4525  
Val Val Tyr Asp Val Asn Val Asp Asp Thr Thr Ile Glu Val Lys Asp 1325  
1315 1320

aaa aaa ctt ggc gta aaa acc acc aca ttg acc agt act ggc aca ggt 4573  
Lys Lys Leu Gly Val Lys Thr Thr Thr Leu Thr Ser Thr Gly Thr Gly 1340  
1330 1335

gct aat aaa ttt gcc cta agc aat caa gct act ggc gat gog ctt gtc 4621  
Ala Asn Lys Phe Ala Leu Ser Asn Gln Ala Thr Gly Asp Ala Leu Val 1360  
1345 1350 1355

FIG.3P

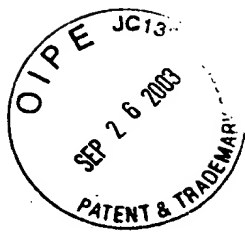
aag gcc agt gat atc gtt gct cat cta aac acc tta tct ggc gac atc Lys Ala Ser Asp Ile Val Ala His Leu Asn Thr Leu Ser Gly Asp Ile 1365 1370 1375	4669
caa act gcc aaa ggg gca agc caa gcg aac aac tca gca ggc tat gtg Gln Thr Ala Lys Gly Ala Ser Gln Ala Asn Asn Ser Ala Gly Tyr Val 1380 1385 1390	4717
gat gct gat ggc aat aag gtc atc tat gac agt acc gat aac aag tac Asp Ala Asp Gly Asn Lys Val Ile Tyr Asp Ser Thr Asp Asn Lys Tyr 1395 1400 1405	4765
tat caa gcc aaa aat gat ggc aca gtt gat aaa acc aaa gaa gtt gcc Tyr Gln Ala Lys Asn Asp Gly Thr Val Asp Lys Thr Lys Glu Val Ala 1410 1415 1420	4813
aaa gac aaa ctg gtc gcc caa gcc caa acc cca gat ggc aca ttg gct Lys Asp Lys Leu Val Ala Gln Ala Gln Thr Pro Asp Gly Thr Leu Ala 1425 1430 1435 1440	4861
caa atg aat gtc aaa tca gtc att aac aaa gaa caa gta aat gat gcc Gln Met Asn Val Lys Ser Val Ile Asn Lys Glu Gln Val Asn Asp Ala 1445 1450 1455	4909



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

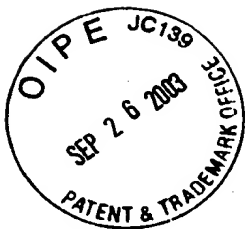
TECH CENTER 1600/2900

FIG.3Q

aat aaa aag caa ggc atc aat gaa gac aac gcc ttt gtt aaa gga ctt Asn Lys Lys Gln Gly Ile Asn Glu Asp Asn Ala Phe Val Lys Gly Leu 1460 1465 1470	4957
gaa aaa gcc gct tct gat aac aaa acc aaa aac gcc gca gta act gtg Glu Lys Ala Ala Ser Asp Asn Lys Thr Lys Asn Ala Ala Val Thr Val 1475 1480 1485	5005
ggt gat tta aat gcc gtt gcc caa aca cag ctg acc ttt gca ggg gat Gly Asp Leu Asn Ala Val Ala Gln Thr Pro Leu Thr Phe Ala Gly Asp 1490 1495 1500	5053
aca ggc aca acg gct aaa aaa ctg ggc gag act ttg acc atc aaa ggt Thr Gly Thr Thr Ala Lys Lys Leu Gly Glu Thr Leu Thr Ile Lys Gly 1505 1510 1515 1520	5101
ggg caa aca gac acc aat aag cta acc gat aat aac atc ggt gtg gta Gly Gln Thr Asp Thr Asn Lys Leu Thr Asp Asn Ile Gly Val Val 1525 1530 1535	5149
gca ggt act gat ggc ttc:act gtc aaa ctt gcc aaa gac cta acc aat Ala Gly Thr Asp Gly Phe Thr Val Lys Leu Ala Lys Asp Leu Thr Asn 1540 1545 1550	5197

FIG.3R

ctt aac agc gtt aat gca ggt ggc acc aaa att gat gac aaa ggc gtg Leu Asn Ser Val Asn Ala Gly Gly Thr Lys Ile Asp Asp Lys Gly Val 1555 1560 1565	5245
tct ttt gta gac tca agc ggt caa gcc aaa gca aac acc cct gtg cta Ser Phe Val Asp Ser Ser Gly Gln Ala Lys Ala Asn Thr Pro Val Leu 1570 1575 1580	5293
agt gcc aat ggg ctg gac ctg ggt ggc aag gtc atc agt aat gtg ggc Ser Ala Asn Gly Leu Asp Leu Gly Gly Lys Val Ile Ser Asn Val Gly 1585 1590 1595 1600	5341
aaa ggc aca aaa gat acc gac gct gcc aat gta caa cag tta aac gaa Lys Gly Thr Lys Asp Thr Asp Ala Ala Asn Val Gln Gln Leu Asn Glu 1605 1610 1615	5389
gta cgc aac ttg ttg ggt ctt ggt aat gct ggt aat gat aac gct gac Val Arg Asn Leu Leu Gly Leu Gly Asn Ala Gly Asn Asp Asn Ala Asp 1620 1625 1630	5437
ggc aat cag gta aac att gcc gac atc aaa aaa gac cca aat tca ggt Gly Asn Gln Val Asn Ile Ala Asp Ile Lys Lys Asp Pro Asn Ser Gly 1635 1640 1645	5485



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3S

tca tca tct aac cgc act gtc atc aaa gca ggc acg gta ctt ggc ggt 5533  
Ser Ser Ser Asn Arg Thr Val Ile Lys Ala Gly Thr Val Leu Gly Gly  
1650 1655 1660

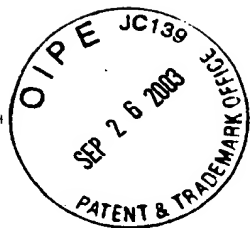
aaa ggt aat aac gat acc gaa aaa ctt gcc act ggt ggt ata caa gtg 5581  
Lys Gly Asn Asn Asp Thr Glu Lys Leu Ala Thr Gly Gly Ile Gln Val  
1665 1670 1675 1680

ggc gtg gat aaa gac ggc aac gct aac ggc gat tta agc aat gtt tgg 5629  
Gly Val Asp Lys Asp Gly Asn Ala Asn Gly Asp Leu Ser Asn Val Trp  
1685 1690 1695

gtc aaa acc caa aaa gat ggc agc aaa aaa gcc ctg ctc gcc act tat 5677  
Val Lys Thr Gln Lys Asp Gly Ser Lys Lys Ala Leu Leu Ala Thr Tyr  
1700 1705 1710

aac gcc gca ggt cag acc aac tat ttg acc aac aac gcc gca gaa gcc 5725  
Asn Ala Ala Gly Gln Thr Asn Tyr Leu Thr Asn Asn Pro Ala Glu Ala  
1715 1720 1725

att gac aga ata aat gaa ggt atc cgc ttc ttc cat gtc aac gat 5773  
Ile Asp Arg Ile Asn Glu Gln Gly Ile Arg Phe Phe His Val Asn Asp  
1730 1735 1740



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.3T

ggc aat caa gag cct gtg gta caa ggg cgt aac ggc att gac tca agt 5821  
Gly Asn Gln Glu Pro Val Val Gln Gly Arg Asn Gly Ile Asp Ser Ser 1760  
1745 1750 1755

ggc tca ggc aag cac tca gtg gog ata ggt ttc cag gcc aag gca gat 5869  
Ala Ser Gly Lys His Ser Val Ala Ile Gly Phe Gln Ala Lys Ala Asp 1775  
1765 1770

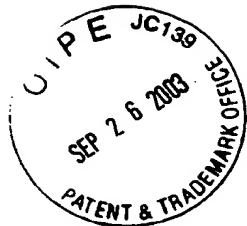
ggt gaa gcc gcc gtt gcc ata ggc aga caa acc caa gca ggc aac caa 5917  
Gly Glu Ala Ala Val Ala Ile Gly Arg Gln Thr Gln Ala Gly Asn Gln 1790  
1780 1785

tcc atc gcc atc ggt gat aac gca caa gcc aog ggc gat caa tcc atc 5965  
Ser Ile Ala Ile Gly Asp Asn Ala Gln Ala Thr Gly Asp Gln Ser Ile 1805  
1795 1800

ggc atc ggt aca ggc aat gtg gta gca ggt aag cac tct ggt gcc atc 6013  
Ala Ile Gly Thr Gly Asn Val Val Ala Gly Lys His Ser Gly Ala Ile 1820  
1810 1815

ggc gac cca agc act gtt aag gct gat aac agt tac agt gtg ggt aat 6061  
Gly Asp Pro Ser Thr Val Lys Ala Asp Asn Ser Tyr Ser Val Gly Asn 1840  
1825 1830 1835





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3U

6109  
aac aac cag ttt acc gat gcc act caa acc gat gtc ttt ggt gtg ggc  
Asn Asn Gln Phe Thr Asp Ala Thr Gln Thr Asp Val Phe Gly Val Gly  
1845 1850 1855

6157  
aat aac atc acc gtg acc gaa agt aac tog gtt gcc tta ggt tca aac  
Asn Asn Ile Thr Val Thr Glu Ser Asn Ser Val Ala Leu Gly Ser Asn  
1860 1865 1870

6205  
tct gcc atc agt gca ggc aca cac gca ggc aca caa gcc aaa aaa tct  
Ser Ala Ile Ser Ala Gly Thr His Ala Gly Thr Gln Ala Lys Lys Ser  
1875 1880 1885

6253  
gac ggc aca gca ggt aca acc acc aca gca ggt gca acc ggt acg gtt  
Asp Gly Thr Ala Gly Thr Thr Thr Thr Ala Gly Ala Thr Gly Thr Val  
1890 1895 1900

6301  
aaa ggc ttt gct gga caa acg gog gtt ggt gcg gtc tcc gtg ggt gcc  
Lys Gly Phe Ala Gly Gln Thr Ala Val Gly Ala Val Ser Val Gly Ala  
1905 1910 1915 1920

6349  
tca ggt gct gaa cgc cgt atc caa aat gtg gca gca ggt gag gtc agt  
Ser Gly Ala Glu Arg Arg Ile Gln Asn Val Ala Ala Gly Glu Val Ser  
1925 1930 1935



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.3V

gcc acc agc acc gat gog gtc aat ggt agc cag ttg tac aaa gcc acc Ala Thr Ser Thr Asp Ala Val Asn Gly Ser Gln Leu Tyr Lys Ala Thr 1940 1945 1950	6397
caa agc att gcc aac gca acc aat gag ctt gac cat ogt atc cac caa Gln Ser Ile Ala Asn Ala Thr Asn Glu Leu Asp His Arg Ile His Gln 1955 1960 1965	6445
aac gaa aat aag gcc aat gca ggg att tca tca gog atg gog atg gog Asn Glu Asn Lys Ala Asn Ala Gly Ile Ser Ser Ala Met Ala Met Ala 1970 1975 1980	6493
tcc atg cca caa gcc tac att cct ggc aga tcc atg gtt acc ggg ggt Ser Met Pro Gln Ala Tyr Ile Pro Gly Arg Ser Met Val Thr Gly Gly 1985 1990 1995 2000	6541
att gcc acc cac aac ggt caa ggt gog gtg gca gtg gga ctg tgg aag Ile Ala Thr His Asn Gly Gln Gly Ala Val Ala Val Gly Leu Ser Lys 2005 2010 2015	6589
ctg tgg gat aat ggt caa tgg gta ttt aaa atc aat ggt tca gcc gat Leu Ser Asp Asn Gly Gln Trp Val Phe Lys Ile Asn Gly Ser Ala Asp 2020 2025 2030	6637



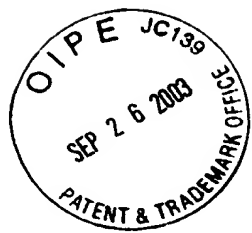
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.3W

acc caa ggc cat gta ggg gcg gca gtt ggt gca ggt ttt cac ttt 6682  
Thr Gln Gly His Val Gly Ala Ala Val Gly Ala Gly Phe His Phe  
2035 2040 2045  
taagccataa atcgcaagat tttactttaa aatcaatctc accatagttg tataaaaacag 6742  
catcagcatc agtcataatta ctgatgctga tgttttttat cacttaaacc attttaccgc 6802  
tcaagtgatt ctctttcacc atgaccaaaat cgccattgat cataggtaaa cttattgagt 6862  
aaattttatc aatgtagttg ttagatatgg ttaaaattgt gccattgacc aaaaaatgac 6922  
cgatttatcc cgaaaaatttc tgattatgat cggttgacct gcagggtgac 6972



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG. 4A

*M. catarrhalis* strain Q8 200kDa gene

48  
ATG aat cac atc tat aaa gtc atc ttt aac aaa gcc aca ggc aca ttt  
Met Asn His Ile Tyr Lys Val Ile Phe Asn Lys Ala Thr Gly Thr Phe  
1 5 10 15

96  
atg gcc gtg gcg gaa tat gcc aaa tcc cac agt acg ggg ggg ggt agc  
Met Ala Val Ala Glu Tyr Ala Lys Ser His Ser Thr Gly Gly Ser  
20 25 30

144  
tgt gct aca ggg caa gtt ggc agt gta cgc act cta agc ttt gcc cgt  
Cys Ala Thr Gly Gln Val Gly Ser Val Arg Thr Leu Ser Phe Ala Arg  
35 40 45

192  
att gcc gcg ctc gct gtc ctc gtg atc ggt gcg acg ctc aat ggc agt  
Ile Ala Ala Leu Ala Val Leu Val Ile Gly Ala Thr Leu Asn Gly Ser  
50 55 60

240  
gct tat gct caa caa att act acc aag atc gaa att ggt caa aca aac  
Ala Tyr Ala Gln Gln Ile Thr Thr Lys Ile Glu Ile Gly Gln Thr Asn  
65 70 75 80

288  
aag ata aac aac acg ctg aaa ggc gat gcc cta gcg aca ggt gaa gca  
Lys Ile Asn Asn Thr Leu Lys Gly Asp Ala Leu Ala Thr Gly Glu Ala  
85 90 95



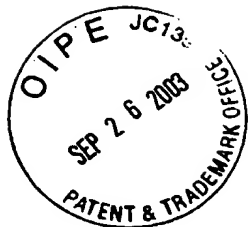
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4B

tcc att gct ttt ggt agt ctt tct aag gca caa ggc tct caa gct att	336
Ser Ile Ala Phe Gly Ser Leu Ser Lys Ala Gln Gly Ser Gln Ala Ile	110
100	105
gct atc ggt agt gtc aaa cca gat cct aat aat ggt agt aat ggt aat	384
Ala Ile Gly Ser Val Lys Pro Asp Pro Asn Asn Gly Ser Asn Gly Asn	125
115	120
gta ggt tcc cac gcc aaa ggt aac gag tcc atc gcc atc ggt ggt gat	432
Val Gly Ser His Ala Lys Gly Asn Glu Ser Ile Ala Ile Gly Gly Asp	140
130	135
gta ttg gct gag ggt gat gcc tog att gcc atc ggt agt gat gac tta	480
Val Leu Ala Glu Gly Asp Ala Ser Ile Ala Ile Gly Ser Asp Asp Leu	160
145	150
tat ttg cct aag aat ctt gat ctg aag aat gaa ttt cac aaa ctt att	528
Tyr Leu Pro Lys Asn Leu Asp Leu Lys Asn Glu Phe His Lys Leu Ile	175
165	170
cat ggc cat gaa ata tta aaa aaa ata caa acc tca acc gat ggt aaa	576
His Gly His Glu Ile Leu Lys Lys Ile Gln Thr Ser Thr Asp Gly Lys	190
180	185



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4C

atc aaa tat cga cgc aca aga gca caa ggg cac gcc agt act gca gtg 624  
Ile Lys Tyr Arg Arg Thr Arg Ala Gln Gly His Ala Ser Thr Ala Val 205  
195 200

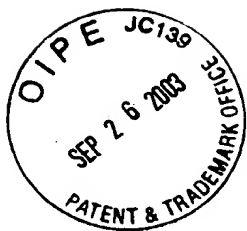
gga gcc atg tca tat gca cag ggt cat ttt tcc aac gcc ttt ggt aca 672  
Gly Ala Met Ser Tyr Ala Gln Gly His Phe Ser Asn Ala Phe Gly Thr 220  
210 215 220

tac gca aca gct gaa gct gcc tat tcc ttg gca gta ggt ctt gcc gcc 720  
Tyr Ala Thr Ala Glu Ala Ala Tyr Ser Leu Ala Val Gly Leu Ala Ala 240  
225 230 235

caa gcc aca aaa caa tct tca atc gct gtt ggt tcc aat gca aaa gct 768  
Gln Ala Thr Lys Gln Ser Ser Ile Ala Val Gly Ser Asn Ala Lys Ala 255  
245 250

aac gog ttt gca gog aca gcc att ggt gga aat act gta gtt aat ttg 816  
Asn Ala Phe Ala Ala Thr Ala Ile Gly Gly Asn Thr Val Val Asn Leu 270  
260 265

ggt cga ggc gtt gcc cta ggt ttt ggt tct cag atc ctt gat agg gat 864  
Gly Arg Gly Val Ala Leu Gly Phe Gly Ser Gln Ile Leu Asp Arg Asp 285  
275 280



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4D

aat aat aca gat gcc agt gcc tat gta cca cta ggt aaa acg tta gca 912  
Asn Asn Thr Asp Ala Ser Ala Tyr Val Pro Leu Gly Lys Thr Leu Ala  
290 295 300

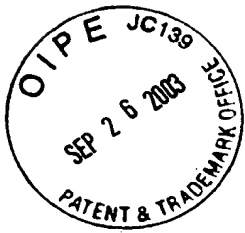
gac cag tat aaa gcc acc cgc cag ggt gat tct acg gat ata ttt tcc 960  
Asp Gln Tyr Lys Ala Thr Arg Gln Gly Asp Ser Thr Asp Ile Phe Ser  
305 310 315 320

att ggt aat agt aat aat aat agc agt atc agg cgt aaa atc atc 1008  
Ile Gly Asn Ser Asn Asn Asn Ser Ser Ile Arg Arg Lys Ile Ile  
325 330 335

aat gtc ggt gcg ggt tct cgg gat acc gat gcg gtc aat gtg gca cag 1056  
Asn Val Gly Ala Gly Ser Arg Asp Thr Asp Ala Val Asn Val Ala Gln  
340 345 350

ctt aaa ttg gtg gag gaa ctg gct aat cgt aaa att act ttt aag ggt 1104  
Leu Lys Leu Val Glu Glu Leu Ala Asn Arg Lys Ile Thr Phe Lys Gly  
355 360 365

gat ggt gac aat aat agc aat agc gta aga ggt ttg ggc aat act 1152  
Asp Gly Asp Asn Asn Ser Asn Ser Val Glu Arg Gly Leu Gly Asn Thr  
370 375 380



RECEIVED

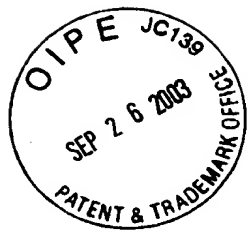
OCT 02 2003

TECH CENTER 1600/2900

FIG.4E

tta act att aaa ggt gat gca cag acc aac gca tta acc gaa gct aac Leu Thr Ile Lys Gly Asp Ala Gln Thr Asn Ala Leu Thr Glu Ala Asn 385 390 395 400	1200
atc ggt gtg gta aca gat ggc aat ggt ctg aaa gtt aaa ctt gct aaa Ile Gly Val Val Thr Asp Gly Asn Gly Leu Lys Val Lys Leu Ala Lys 405 410 415	1248
gag ctg act gga ttg acc agt gtc tcc gct acc aac aaa atc acc gtt Glu Leu Thr Gly Leu Thr Ser Val Ser Ala Thr Asn Lys Ile Thr Val 420 425 430	1296
agt aat acc aac aac aac gcc gag cta caa agc ggt ggt ttg acc Ser Asn Thr Asn Asn Asn Ala Glu Leu Gln Ser Gly Gly Leu Thr 435 440 445	1344
ttt agc cca ata aca ggt aca aaa aca gat aaa acc gtc tac agc att Phe Ser Pro Ile Thr Gly Thr Lys Thr Asp Lys Thr Val Tyr Ser Ile 450 455 460	1392
gat gga ttg aag ttt act aat gat agt aat agt ata gca act aaa ggt Asp Gly Leu Lys Phe Thr Asn Asp Ser Asn Ser Ile Ala Thr Lys Gly 465 470 475 480	1440





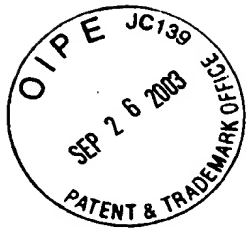
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4F

act act cgt att acc aaa aag aaa att ggt ttt gct ggt act aat gat	1488
Thr Thr Arg Ile Thr Lys Lys Lys Ile Gly Phe Ala Gly Thr Asn Asp	495
	490
	485
gga gtt gat gaa agc aaa cct tat ctt gac aac gaa aag cta aaa gtt	1536
Gly Val Asp Glu Ser Lys Lys Pro Tyr Leu Asp Asn Glu Lys Leu Lys Val	510
	505
	500
ggc aac agc acc cta aac agt ggt agc ttg act gtt aat aac acc act	1584
Gly Asn Ser Thr Leu Asn Ser Gly Ser Leu Thr Val Asn Asn Thr Thr	525
	520
	515
ggt aat aaa caa atc caa gtc ggt gct aat ggc att aaa ttt gcc aca	1632
Gly Asn Lys Gln Ile Gln Val Gly Ala Asn Gly Ile Lys Phe Ala Thr	540
	535
	530
gtc gct aat aat gtt gca aat acc tca gca aca gtc ggc act gct cgt	1680
Val Ala Asn Asn Val Ala Asn Thr Ser Ala Thr Val Gly Thr Ala Arg	560
	555
	550
	545
att acc gaa gag aaa att ggt ttt gct ggt act aat gat gga gtt gat	1728
Ile Thr Glu Glu Lys Ile Gly Phe Ala Gly Thr Asn Asp Gly Val Asp	575
	570
	565



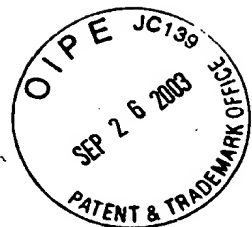
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG. 4G

gaa caa gca cca tat ttg gat aaa gaa cga ctt aaa gtg ggt cgt gtt	1776
Glu Gln Ala Pro Tyr Leu Asp Lys Glu Arg Leu Lys Val Gly Arg Val	580 585 590
gaa att acc aca gat agt ggt att aat gct ggt aat cac aag att acc	1824
Glu Ile Thr Thr Asp Ser Gly Ile Asn Ala Gly Asn His Lys Ile Thr	595 600 605
gga ctt act aat ggt ata gca aat acc gat gcg gtt acc atc aaa cag	1872
Gly Leu Thr Asn Gly Ile Ala Asn Thr Asp Ala Val Thr Ile Lys Gln	610 615 620
ctc aaa gac gcc aag cct act tta aac gca ggc gat ggc atc agt att	1920
Leu Lys Asp Ala Lys Pro Thr Leu Asn Ala Gly Asp Gly Ile Ser Ile	625 630 635 640
aat agt aat aac ggg gat cta gtt gat agt agt ggc aat att acc acc	1968
Asn Ser Asn Asn Gly Asp Leu Val Asp Ser Ser Gly Asn Ile Thr Thr	645 650 655
cca act tat aac att agc gtg aaa acc act aag ctt aac agt aat ggc	2016
Pro Thr Tyr Asn Ile Ser Val Lys Thr Thr Lys Leu Asn Ser Asn Gly	660 665 670



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4H

acc agt ggt aat aat aaa ttt agt gtt agt aat gct cat gat aac aat	2064
Thr Ser Gly Asn Asn Lys Phe Ser Val Ser Asn Ala His Asp Asn Asn	
675 680 685	
agc tta gtt acc gcc aaa gat ttg gca gac tat cta aat aaa gtc aat	2112
Ser Leu Val Thr Ala Lys Asp Leu Ala Asp Tyr Leu Asn Lys Val Asn	
690 695 700	
gaa acg gct gac agt gct cta cca agc ttt aaa gtc caa aac ggt gat	2160
Glu Thr Ala Asp Ser Ala Leu Pro Ser Phe Lys Val Gln Asn Gly Asp	
705 710 715 720	
aat agc aac aac gcc atc acc gtg ggt aaa gat aca aac ggc aag acc	2208
Asn Ser Asn Asn Ala Ile Thr Val Gly Lys Asp Thr Asn Gly Lys Thr	
725 730 735	
ttc aac acc tta aaa ctc aaa ggt gaa aac ggt gtt aat att acg acc	2256
Phe Asn Thr Leu Lys Leu Lys Gly Glu Asn Gly Val Asn Ile Thr Thr	
740 745 750	
aat aga gcc aca ggt aca gtt acc ttt ggc att gac caa agt aat ggt	2304
Asn Arg Ala Thr Gly Thr Val Thr Phe Gly Ile Asp Gln Ser Asn Gly	
755 760 765	



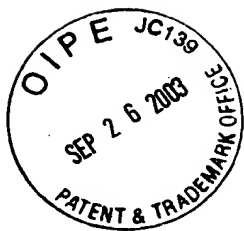
RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4I

ctc acc acg cct aag ctg acc gtg ggt agc gat aca aat ggt aat cga Leu Thr Thr Pro Lys Leu Thr Val Gly Ser Asp Thr Asn Gly Asn Arg 770 775 780 2352
ttg gtt att gag caa gtc cct agc gct gac ggt aac agc acc aaa aac Leu Val Ile Glu Gln Val Pro Ser Ala Asp Gly Asn Ser Thr Lys Asn 785 790 795 800 2400
atc att aaa gga ttg tcc cca aca ctg cct agc att gcc agt cca agt Ile Ile Lys Gly Leu Ser Pro Thr Leu Pro Ser Ile Ala Ser Pro Ser 805 810 815 2448
ggc cgc aac ata gca ctg ggc aat aca atc gaa gaa aaa gac aaa tcc Gly Arg Asn Ile Ala Leu Gly Asn Thr Ile Glu Glu Lys Asp Lys Ser 820 825 830 2496
aac gct gcc agc att gat gat gtg cta aat gca ggc ttt aac cta aaa Asn Ala Ala Ser Ile Asp Asp Val Leu Asn Ala Gly Phe Asn Leu Lys 835 840 845 2544
aat aat ggc aaa gac aaa gac ttt gtc tcc act tat gac act gtt gac Asn Asn Gly Lys Asp Lys Asp Phe Val Ser Thr Tyr Asp Thr Val Asp 850 855 860 2592



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4J

ttt atc gat ggc aat gcc acc acc gcc aca gta act tat gat gaa gcc	2640
Phe Ile Asp Gly Asn Ala Thr Thr Ala Thr Val Thr Tyr Asp Glu Ala	
865 870 875 880	
aat caa acc agt aaa gtg gcg tat gat gtg aat gtg gat gag aaa acc	2688
Asn Gln Thr Ser Lys Val Ala Tyr Asp Val Asn Val Asp Glu Lys Thr	
885 890 895	
att gaa ctg aca ggc gat aat ggc aag aaa caa ctt ggc gtc aaa acc	2736
Ile Glu Leu Thr Gly Asp Asn Gly Lys Lys Gln Leu Gly Val Lys Thr	
900 905 910	
atc aaa ctg acc gaa aca agt act aat ggt aat gca act aca ttt agt	2784
Ile Lys Leu Thr Glu Thr Ser Thr Asn Gly Asn Ala Thr Thr Phe Ser	
915 920 925	
acc gac gat gac cat gcc ctt gtt aaa gcc agt gat atc gcc ggc aat	2832
Thr Asp Asp Asp His Ala Leu Val Lys Ala Ser Asp Ile Ala Gly Asn	
930 935 940	
cta aac acc cta gcc gag gaa att cac acc acc aaa ggc aca gca aac	2880
Leu Asn Thr Leu Ala Glu Glu Ile His Thr Thr Lys Gly Thr Ala Asn	
945 950 955 960	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.4K

acc gcc cta caa acc ttt acc gtt aaa aag gta gat gaa aat gat aag 2928  
Thr Ala Leu Gln Thr Phe Thr Val Lys Lys Val Asp Glu Asn Asp Lys  
965 970 975

gct gat gac acc aac gcc atc acc gtg ggt aaa gat gcc aca agt ggt 2976  
Ala Asp Asp Thr Asn Ala Ile Thr Val Gly Lys Asp Gly Thr Ser Gly  
980 985 990

aaa gtc aac acc tta aaa ctc aaa ggt aaa aac ggt ctt gat att aaa 3024  
Lys Val Asn Thr Leu Lys Leu Lys Gly Lys Asn Gly Leu Asp Ile Lys  
995 1000 1005

acc gac aaa gat ggt acg gtt acc ttt gcc att aac acc caa agc ggt 3072  
Thr Asp Lys Asp Gly Thr Val Thr Phe Gly Ile Asn Thr Gln Ser Gly  
1010 1015 1020

ctt aaa gcc ggc gac agc acc act cta aac aac aat gcc ttg tct att 3120  
Leu Lys Ala Gly Asp Ser Thr Thr Leu Asn Asn Asn Gly Leu Ser Ile  
1025 1030 1035 1040

aaa aac acc gct agt aac gaa caa atc caa gtc ggt gct gat gcc gtg 3168  
Lys Asn Thr Ala Ser Asn Glu Gln Ile Gln Val Gly Ala Asp Gly Val  
1045 1050 1055

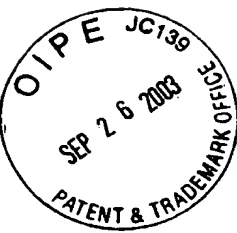
FIG.4L

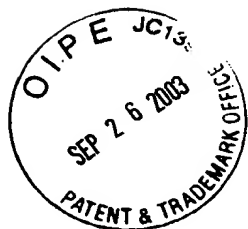
aag ttt gcc atg gtt aat aat ggt gtt gta ggt gct ggc att gat ggc Lys Phe Ala Met Val Asn Asn Gly Val Gly Ala Gly Ile Asp Gly	1060 1065 1070	3216
aca act cgc att acc aga gat gaa att ggc ttt act ggg act aat ggc Thr Thr Arg Ile Thr Arg Asp Glu Ile Gly Phe Thr Gly Thr Asn Gly	1075 1080 1085	3264
tca ctt gat aaa agc aaa ccc cac cta agc aaa gac ggc att aac gca Ser Leu Asp Lys Ser Lys Pro His Leu Ser Lys Asp Gly Ile Asn Ala	1090 1095 1100	3312
ggt ggt aaa aag att acc aac att caa tca ggt gag att gcc aaa aac Gly Gly Lys Lys Ile Thr Asn Ile Gln Ser Gly Glu Ile Ala Lys Asn	1105 1110 1115 1120	3360
agc cat gat gct gtg aca ggc ggc aag att tat gat tta aaa acc gaa Ser His Asp Ala Val Thr Gly Gly Lys Ile Tyr Asp Leu Lys Thr Glu	1125 1130 1135	3408
ctt gaa aat aaa atc agc agt act gcc aaa aca gca caa aac tca tta Leu Glu Asn Lys Ile Ser Ser Thr Ala Lys Thr Ala Gln Asn Ser Leu	1140 1145 1150	3456

RECEIVED

OCT 02 2003

TECH CENTER 1600/2900





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG. 4M

3504  
cac gaa ttc tca gta gca gat gaa caa ggt aat aac ttt acg gtt agt  
His Glu Phe Ser Val Ala Asp Glu Gln Gly Asn Asn Phe Thr Val Ser  
1155 1160 1165

3552  
aac cct tac tcc agt tat gac acc tca aag acc tct gat gtc atc acc  
Asn Pro Tyr Ser Ser Tyr Asp Thr Ser Lys Thr Ser Asp Val Ile Thr  
1170 1175 1180

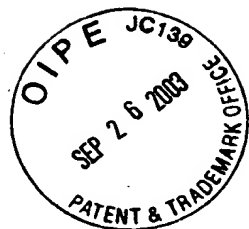
3600  
ttt gca ggt gaa aac ggc att acc acc aag gta aat aaa ggt gtg gtg  
Phe Ala Gly Glu Asn Gly Ile Thr Thr Lys Val Asn Lys Gly Val Val  
1185 1190 1195 1200

3648  
cgt gtg ggc att gac caa acc aaa ggc tta acc acg cct aag ctg acc  
Arg Val Gly Ile Asp Gln Thr Lys Gly Leu Thr Thr Pro Lys Leu Thr  
1205 1210 1215

3696  
gtg ggt aat aat ggc aaa ggc att gtc att aac agc caa aat ggt  
Val Gly Asn Asn Asn Gly Lys Gly Ile Val Ile Asn Ser Gln Asn Gly  
1220 1225 1230

3744  
caa aat acc atc aca gga cta agc aac act cta gct aat gtt acc aat  
Gln Asn Thr Ile Thr Gly Leu Ser Asn Thr Leu Ala Asn Val Thr Asn  
1235 1240 1245





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4N

gat aaa ggt agc gta cgc acc aca gaa cag ggc aat ata atc aaa gac 3792  
Asp Lys Gly Ser Val Arg Thr Thr Glu Gln Gly Asn Ile Ile Lys Asp  
1250 1255 1260

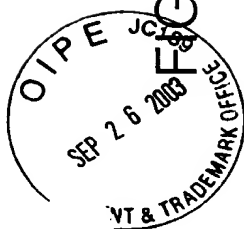
gaa gac aaa acc cgt gcc gcc agc att gtt gat gtg cta agc gca ggc 3840  
Glu Asp Lys Thr Arg Ala Ala Ser Ile Val Asp Val Leu Ser Ala Gly  
1265 1270 1275 1280

ttt aac ttg caa ggc aat ggt gaa gcg gtt gac ttt gtc tcc act tat 3888  
Phe Asn Leu Gln Gly Asn Gly Glu Ala Val Asp Phe Val Ser Thr Tyr  
1285 1290 1295

gac acc gtc aac ttt gcc aat ggc aat acc acc acc gct aag gtg acc 3936  
Asp Thr Val Asn Phe Ala Asn Gly Asn Thr Thr Thr Ala Lys Val Thr  
1300 1305 1310

tat gat gac aca agc aaa acc agt aaa gtg gtc tat gat gtc aat gtg 3984  
Tyr Asp Asp Thr Ser Lys Thr Ser Lys Val Val Tyr Asp Val Asn Val  
1315 1320 1325

gat gat aca acc att gaa gtt aaa gat aaa ctt ggc gta aaa acc 4032  
Asp Asp Thr Thr Ile Glu Val Lys Asp Lys Lys Leu Gly Val Lys Thr  
1330 1335 1340



FG.40

acc aca ttg acc agt act ggc aca ggt gct aat aaa ttt gcc cta agc 4080  
Thr Thr Leu Thr Ser Thr Gly Thr Gly Ala Asn Lys Phe Ala Leu Ser  
1345 1350 1355 1360

aat caa gct act ggc gat gcg ctt gtc aag gcc agt gat atc gtt gct 4128  
Asn Gln Ala Thr Gly Asp Ala Leu Val Lys Ala Ser Asp Ile Val Ala  
1365 1370 1375

cat cta aac acc tta tct ggc gac atc caa act gcc aaa ggg gca agc 4176  
His Leu Asn Thr Leu Ser Gly Asp Ile Gln Thr Ala Lys Gly Ala Ser  
1380 1385 1390

caa gcg aac aac tca gca ggc tat gtg gat gct gat ggc aat aag gtc 4224  
Gln Ala Asn Asn Ser Ala Gly Tyr Val Asp Ala Asp Gly Asn Lys Val  
1395 1400 1405

atc tat gac agt acc gat aac aag tac tat caa gcc aaa aat gat ggc 4272  
Ile Tyr Asp Ser Thr Asp Asn Lys Tyr Tyr Gln Ala Lys Asn Asp Gly  
1410 1415 1420

aca gtt gat aaa acc aaa gaa gtt gcc aaa gac aaa ctg gtc gcc caa 4320  
Thr Val Asp Lys Thr Lys Glu Val Ala Lys Asp Lys Leu Val Ala Gln  
1425 1430 1435 1440

RECEIVED

OCT 0 2 2003

TECH CENTER 1600/2900

FIG.4P

gcc caa acc cca gat ggc aca ttg gct caa atg aat gtc aaa tca gtc Ala Gln Thr Pro Asp Gly Thr Leu Ala Gln Met Asn Val Lys Ser Val 1445 1450 1455	4368
att aac aaa gaa caa gta aat gat gcc aat aaa aag caa ggc atc aat Ile Asn Lys Glu Gln Val Asn Asp Ala Asn Lys Lys Gln Gly Ile Asn 1460 1465 1470	4416
gaa gac aac gcc ttt gtt aaa gga ctt gaa aaa gcc gct tct gat aac Glu Asp Asn Ala Phe Val Lys Gly Leu Glu Lys Ala Ala Ser Asp Asn 1475 1480 1485	4464
aaa acc aaa aac gcc gca gta act gtg ggt gat tta aat gcc gtt gcc Lys Thr Lys Asn Ala Ala Val Thr Val Gly Asp Leu Asn Ala Val Ala 1490 1495 1500	4512
caa aca cog ctg acc ttt gca ggg gat aca ggc aca acg gct aaa aaa Gln Thr Pro Leu Thr Phe Ala Gly Asp Thr Gly Thr Thr Ala Lys Lys 1505 1510 1515 1520	4560
ctg ggc gag act ttg acc atc aaa ggt ggg caa aca gac acc aat aag Leu Gly Glu Thr Leu Thr Ile Lys Gly Gly Gln Thr Asp Thr Asn Lys 1525 1530 1535	4608



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.4Q

cta acc gat aat aac atc ggt gtg gta gca ggt act gat ggc ttc act	4656
Leu Thr Asp Asn Ile Gly Val Val Ala Gly Thr Asp Gly Phe Thr	
1540	1550
1545	
gtc aaa ctt gcc aaa gac cta acc aat ctt aac agc gtt aat gca ggt	4704
Val Lys Leu Ala Lys Asp Leu Thr Asn Leu Asn Ser Val Asn Ala Gly	
1555	1565
1560	
ggc acc aaa att gat gaa aaa ggc atc tct ttt gta gac gca aac ggt	4752
Gly Thr Lys Ile Asp Glu Lys Gly Ile Ser Phe Val Asp Ala Asn Gly	
1570	1580
1575	
caa gcc aaa gca aac acc cct gtg cta agt gcc aat ggg ctg gac ctg	4800
Gln Ala Lys Ala Asn Thr Pro Val Leu Ser Ala Asn Gly Leu Asp Leu	
1585	1600
1590	
1595	
ggc aag gtc atc agt aat gtg ggc aaa ggc aca aaa gat acc gac	4848
Gly Gly Lys Val Ile Ser Asn Val Gly Lys Gly Thr Lys Asp Thr Asp	
1605	1615
1610	
gct gcc aat gta caa cag tta aac gaa gta cgc aac ttg ttg ggt ctt	4896
Ala Ala Asn Val Gln Gln Leu Asn Glu Val Arg Asn Leu Leu Gly Leu	
1620	1630
1625	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4R

ggt aat gat aac gct gac ggc aat cag gta aac att gcc gac atc aaa 4944  
Gly Asn Asp Asn Ala Asp Gly Asn Gln Val Asn Ile Ala Asp Ile Lys  
1635 1640 1645

aaa gac cca aat tca ggt tca tca tct aac cgc act gtc atc aaa gca 4992  
Lys Asp Pro Asn Ser Gly Ser Ser Ser Asn Arg Thr Val Ile Lys Ala  
1650 1655 1660

ggc acg gta ctt ggc ggt aaa ggt aat aac gat acc gaa aaa ctt gcc 5040  
Gly Thr Val Leu Gly Gly Lys Gly Asn Asn Asp Thr Glu Lys Leu Ala  
1665 1670 1675 1680

act ggt ggt gta caa gtg ggc gtg gat aaa gac ggc aac gct aac ggc 5088  
Thr Gly Gly Val Gln Val Gly Val Asp Lys Asp Gly Asn Ala Asn Gly  
1685 1690 1695

gat tta agc aat gtt tgg gtc aaa acc caa aaa gat ggc agc aaa aaa 5136  
Asp Leu Ser Asn Val Val Val Lys Thr Gln Lys Asp Gly Ser Lys Lys  
1700 1705 1710

gcc ctg ctc gcc act tat aac gcc gca ggt cag acc aac tat gtg acc 5184  
Ala Leu Leu Ala Thr Tyr Asn Ala Ala Gly Gln Thr Asn Tyr Val Thr  
1715 1720 1725



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4S

aac aac ccc gca gaa gcc att gac aga ata aat gaa caa ggt atc cgc Asn Asn Pro Ala Glu Ala Ile Asp Arg Ile Asn Glu Gln Gly Ile Arg 1730 1735 1740	5232
ttc ttc cat gtc aac gat gcc aat caa gag cct gtg gta caa ggg cgt Phe Phe His Val Asn Asp Gly Asn Gln Glu Pro Val Val Gln Gly Arg 1745 1750 1755 1760	5280
aac ggc att gac tca agt gcc tca ggc aag cac tca gtg gcg ata ggt Asn Gly Ile Asp Ser Ser Ala Ser Gly Lys His Ser Val Ala Ile Gly 1765 1770 1775	5328
ttc cag gcc aag gca gat ggt gaa gcc gcc gtt gcc ata ggc aga caa Phe Gln Ala Lys Ala Asp Gly Glu Ala Ala Val Ala Ile Gly Arg Gln 1780 1785 1790	5376
acc caa gca ggc aac caa tcc atc gcc atc ggt gat aac gca caa gcc Thr Gln Ala Gly Asn Gln Ser Ile Ala Ile Gly Asp Asn Ala Gln Ala 1795 1800 1805	5424
acg ggc gat caa tcc atc gcc atc ggt aca ggc aat gtg gta gca ggt Thr Gly Asp Gln Ser Ile Ala Ile Gly Thr Gly Asn Val Val Ala Gly 1810 1815 1820	5472



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.4T

aag cac tct ggt gcc atc ggc gac cca agc act gtt aag gct gat aac 5520  
Lys His Ser Gly Ala Ile Gly Asp Pro Ser Thr Val Lys Ala Asp Asn  
1825 1830 1835 1840

agt tac agt gtg ggt aat aac aac cag ttt acc gat gcc act caa acc 5568  
Ser Tyr Ser Val Gly Asn Asn Asn Gln Phe Thr Asp Ala Thr Gln Thr  
1845 1850 1855

gat gtc ttt ggt gtg ggc aat aac atc acc gtg acc gaa agt aac tcg 5616  
Asp Val Phe Gly Val Gly Asn Asn Ile Thr Val Thr Glu Ser Asn Ser  
1860 1865 1870

gtt gcc tta ggt tca aac tct gcc atc agt gca ggc aca cac gca ggc 5664  
Val Ala Leu Gly Ser Asn Ser Ala Ile Ser Ala Gly Thr His Ala Gly  
1875 1880 1885

aca caa gcc aaa aaa tct gac ggc aca gca ggt aca acc acc aca gca 5712  
Thr Gln Ala Lys Lys Ser Asp Gly Thr Ala Gly Thr Thr Thr Ala  
1890 1895 1900

ggt gcc aca ggt acg gtt aaa ggc ttt gct gga caa acg gog gtt ggt 5760  
Gly Ala Thr Gly Thr Val Lys Gly Phe Ala Gly Gln Thr Ala Val Gly  
1905 1910 1915 1920



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.4U

gcg gtc tcc gtg ggt gcc tca ggt gct gaa cgc cgt atc caa aat gtg 5808  
Ala Val Ser Val Gly Ala Ser Gly Ala Glu Arg Arg Ile Gln Asn Val 1935  
1925 1930

gca gca ggt gag gtc agt gcc acc agc acc gat gcg gtc aat ggt agc 5856  
Ala Ala Gly Glu Val Ser Ala Thr Ser Thr Asp Ala Val Asn Gly Ser 1950  
1940 1945

cag ttg tac aaa gcc acc caa agc att gcc aac gca acc aat gag ctt 5904  
Gln Leu Tyr Lys Ala Thr Gln Ser Ile Ala Asn Ala Thr Asn Glu Leu 1965  
1955 1960

gac cat cgt atc cac caa aac gaa aat aaa gcc aat gca ggg att tca 5952  
Asp His Arg Ile His Gln Asn Glu Asn Lys Ala Asn Ala Gly Ile Ser 1980  
1970 1975

tca gcg atg gcg atg gcg tcc atg cca caa gcc tac att cct ggc aga 6000  
Ser Ala Met Ala Met Ala Ser Met Pro Gln Ala Tyr Ile Pro Gly Arg 2000  
1985 1990

tcc atg gtt acc ggg ggt att gcc acc cac aac ggt caa ggt gcg gtg 6048  
Ser Met Val Thr Gly Gly Ile Ala Thr His Asn Gly Gln Gly Ala Val 2015  
2005 2010





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.4V

gca gtg gga ctg tcg aag ctg gat aat ggt caa tgg gta ttt aaa	6096
Ala Val Gly Leu Ser Lys Leu Ser Asp Asn Gly Gln Trp Val Phe Lys	
2020	2025
atc aat ggt tca gcc gat acc caa ggc cat gta ggg gcg gca gtt ggt	6144
Ile Asn Gly Ser Ala Asp Thr Gln Gly His Val Gly Ala Ala Val Gly	
2035	2040
gca ggt ttt cac ttt	6159
Ala Gly Phe His Phe	
2050	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.5A

*Moraxella catarrhalis* les1 200kDa

ATG aat cac atc tat aaa gtc atc ttt aac aaa gcc aca ggc aca ttt 48  
Met Asn His Ile Tyr Lys Val Ile Phe Asn Lys Ala Thr Gly Thr Phe 15  
1 5 10

atg gcc gtg gca gag tgc gcc aaa tcc cac agc gga ggg agt agc agt 96  
Met Ala Val Ala Glu Cys Ala Lys Ser His Ser Gly Gly Ser Ser Ser 30  
20 25

agt acc gca gga cag gtg ggc agc tct cct gtc atc cgc ctg act cgt 144  
Ser Thr Ala Gly Gln Val Gly Ser Ser Pro Val Ile Arg Leu Thr Arg 45  
35 40

gtt gcc acg ctc gct atc cta gtg atc ggt gcg acg ctc aat ggc agt 192  
Val Ala Thr Leu Ala Ile Leu Val Ile Gly Ala Thr Leu Asn Gly Ser 60  
50 55

gct tat gct caa aat aat agc aag atc gca ttt ggt acc aca ggc aac 240  
Ala Tyr Ala Gln Asn Asn Ser Lys Ile Ala Phe Gly Thr Thr Gly Asn 75  
65 70 80

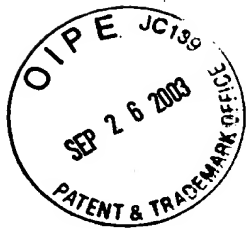
aat gac aat gcc tog gct agc aat gaa gca tcc att gct att ggt agt 288  
Asn Asp Asn Ala Ser Ala Ser Asn Glu Ala Ser Ile Ala Ile Gly Ser 95  
85 90



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/290

FIG.5B

ctt gct aag gca cat gcc aat caa gct att gct atc ggt ggt agc aaa Leu Ala Lys Ala His Ala Asn Gln Ala Ile Ala Ile Gly Gly Ser Lys 100 105 110 336
cca gat cct cgt aat caa gog gct aat cag aag gca ggt tcc cac gcc Pro Asp Pro Arg Asn Gln Ala Ala Asn Gln Lys Ala Gly Ser His Ala 115 120 125 384
aaa ggt aaa gag tcc atc gcc atc ggt gat gta ctg gct gag ggt Lys Gly Lys Glu Ser Ile Ala Ile Gly Gly Asp Val Leu Ala Glu Gly 130 135 140 432
gat gcc tog att gcc att ggt agt gat gac tta tat ttg gat agg aat Asp Ala Ser Ile Ala Ile Gly Ser Asp Asp Leu Tyr Leu Asp Arg Asn 145 150 155 160 480
agc act aac tct aaa tat cca aat ggt ctt ctt agc act ctt att caa Ser Thr Asn Ser Lys Tyr Pro Asn Gly Leu Leu Ser Thr Leu Ile Gln 165 170 175 528
aac cat aca gta tta cgc caa ata cga gac tca aat ggt tct cag aaa Asn His Thr Val Leu Arg Gln Ile Arg Asp Ser Asn Gly Ser Gln Lys 180 185 190 576



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.5C

624  
tat aga cgc aca gca gaa gga cac gcc agt act gca gtg gga gcc  
Tyr Arg Arg Thr Ala Ala Glu Gly His Ala Ser Thr Ala Val Gly Ala  
195 200 205

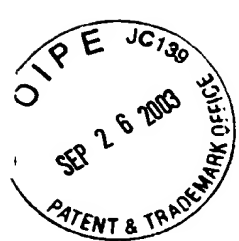
672  
atg gca tat gca aag ggt cat ttt gcc aac gcc ttt ggt aca cgg tca  
Met Ala Tyr Ala Lys Gly His Phe Ala Asn Ala Phe Gly Thr Arg Ser  
210 215 220

720  
aca gct gaa ggc aac tat tcc ttg gca gta ggt ctt acc gcc aaa gcc  
Thr Ala Glu Gly Asn Tyr Ser Leu Ala Val Gly Leu Thr Ala Lys Ala  
225 230 235 240

768  
gaa aaa gga tat aca atc gct att ggt tct aat gca caa gct atc aat  
Glu Lys Gly Tyr Thr Ile Ala Ile Gly Ser Asn Ala Gln Ala Ile Asn  
245 250 255

816  
tat gga gca cta gcc ctt ggt gca gat act cga gtt gat ttg gat tac  
Tyr Gly Ala Leu Ala Leu Gly Ala Asp Thr Arg Val Asp Leu Asp Tyr  
260 265 270

864  
ggt att gcc cta ggt tat ggt tct cag atc ctt aat aat aat aat  
Gly Ile Ala Leu Gly Tyr Gly Ser Gln Ile Leu Asn Asn Asn Asn  
275 280 285



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.5D

aat aat aat aaa gcc tat gta cca gaa ggt aat ggg tca aac ata aaa 912  
Asn Asn Lys Lys Ala Tyr Val Pro Glu Gly Asn Gly Ser Asn Ile Lys  
290 295 300

tog tct aaa gcc acc ggc aat ggt tta ttt tcc att ggt agt agc act 960  
Ser Ser Lys Ala Thr Gly Asn Gly Leu Phe Ser Ile Gly Ser Ser Thr  
305 310 315 320

atc aag cgt aaa atc atc aat gtc ggt gca ggt tat gag gat acc gat 1008  
Ile Lys Arg Lys Ile Ile Asn Val Gly Ala Gly Tyr Glu Asp Thr Asp  
325 330 335

gcg gtc aat gtg gca cag cta aaa gcg gtg gag aat ctg gct aag cgt 1056  
Ala Val Asn Val Ala Gln Leu Lys Ala Val Glu Asn Leu Ala Lys Arg  
340 345 350

caa att act ttt aag ggt gat gat aac ggt act ggc gtt aag aaa aaa 1104  
Gln Ile Thr Phe Lys Gly Asp Asp Asn Gly Thr Gly Val Lys Lys Lys  
355 360 365

ctg ggc gag act tta acc att aaa ggt ggt gag acc caa gcg gac aag 1152  
Leu Gly Glu Thr Leu Thr Ile Lys Gly Gly Glu Thr Gln Ala Asp Lys  
370 375 380

FIG.5E

cta acc gat aat aac att ggt gtg gta aca gat aat aat act ggt	1200
Leu Thr Asp Asn Asn Ile Gly Val Thr Asp Asn Asn Thr Gly	
385	390
	395
	400
ctg aaa gtt aaa ctt gct aaa aac cta agc ggt ctt gaa aca gtt agc	1248
Leu Lys Val Lys Leu Ala Lys Asn Leu Ser Gly Leu Glu Thr Val Ser	
	405
	410
	415
acc aaa aac cta acc gcc agc gag aaa gtt acg gta ggt agt ggt aat	1296
Thr Lys Asn Leu Thr Ala Ser Glu Lys Val Thr Val Gly Ser Gly Asn	
	420
	425
	430
aac acc gct gag cta caa agc ggt ggt tta acc ttt acc cca aca aca	1344
Asn Thr Ala Glu Leu Gln Ser Gly Gly Leu Thr Phe Thr Pro Thr Thr	
	435
	440
	445
aat gca agc aca gac aaa acc gtc tat ggc act gat ggg ctt aag ttt	1392
Asn Ala Ser Thr Asp Lys Thr Val Tyr Gly Thr Asp Gly Leu Lys Phe	
	450
	455
	460
act gat aat tct aat acg gca ctt gaa gat act act cgt atc acc aaa	1440
Thr Asp Asn Ser Asn Thr Ala Leu Glu Asp Thr Thr Arg Ile Thr Lys	
	465
	470
	475
	480



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.5F

gat aaa att ggt ttt agc aat aaa gct ggt aca gtt gat gaa aac aaa	1488
Asp Lys Ile Gly Phe Ser Asn Lys Ala Gly Thr Val Asp Glu Asn Lys	485 490 495
cct tat ctt gat aaa gac aag cta aaa gtt ggc aac agc acc cta aac	1536
Pro Tyr Leu Asp Lys Asp Lys Lys Leu Lys Val Gly Asn Ser Thr Leu Asn	500 505 510
aac ggt ggc ttg act gtt aat aac acc att ggt ggt agc aat aaa caa	1584
Asn Gly Gly Leu Thr Val Asn Asn Thr Ile Gly Gly Ser Asn Lys Gln	515 520 525
atc caa gtc ggt gct gat ggc att aaa ttt gcc gat gtg aat gtt aat	1632
Ile Gln Val Gly Ala Asp Gly Ile Lys Phe Ala Asp Val Asn Val Asn	530 535 540
gta tca aat gcc gca aaa ttc ggc act act cgt att acc gaa gag gaa	1680
Val Ser Asn Ala Ala Lys Phe Gly Thr Thr Arg Ile Thr Glu Glu Glu	545 550 555 560
att ggc ttt gct gat gct gat ggt aaa gtt gat aaa aag tca cca tat	1728
Ile Gly Phe Ala Asp Ala Asp Gly Lys Val Asp Lys Lys Ser Pro Tyr	565 570 575



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/29

## FIG.5G

1776  
ttg gat aaa caa ctt caa gtg ggt ggt gtt aaa att acc aaa gac  
Leu Asp Lys Lys Gln Leu Gln Val Gly Gly Val Lys Ile Thr Lys Asp  
580 585 590

1824  
agt ggc att aat gca ggt gat caa aag atc agt aat gtt aaa gat gca  
Ser Gly Ile Asn Ala Gly Asp Gln Lys Ile Ser Asn Val Lys Asp Ala  
595 600 605

1872  
acg gac gat acc gat gca gtc act tat aaa cag ctt aaa caa gtc caa  
Thr Asp Asp Thr Asp Ala Val Thr Tyr Lys Gln Leu Lys Gln Val Gln  
610 620

1920  
caa gac gcc gac ggt gcc cta caa agc ttc tct att cgt gat gaa aaa  
Gln Asp Ala Asp Gly Ala Leu Gln Ser Phe Ser Ile Arg Asp Glu Lys  
625 630 635 640

1968  
ggt cag gaa ttt acg att agt aac ttg tat tct aat ggt aat acc cca  
Gly Gln Glu Phe Thr Ile Ser Asn Leu Tyr Ser Asn Gly Asn Thr Pro  
645 650 655

2016  
aat acc ttt gag acc atc acc ttt gca ggt gaa aac ggc atc agt atc  
Asn Thr Phe Glu Thr Ile Thr Phe Ala Gly Glu Asn Gly Ile Ser Ile  
660 665 670





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.5H

agc aat gac ata gcc aaa ggt aaa gtc aaa gtt ggt att gac cca atc Ser Asn Asp Ile Ala Lys Gly Lys Val Lys Val Gly Ile Asp Pro Ile 675 680 685	2064
aat ggt ctc acc acg cct aag ctg acc gtg ggt agc gat aaa gat ggt Asn Gly Leu Thr Thr Pro Lys Leu Thr Val Gly Ser Asp Lys Asp Gly 690 695 700	2112
aaa act caa ttg gtt att gag caa gtg gct agc ggt aac gac acc aaa Lys Thr Gln Leu Val Ile Glu Gln Val Ala Ser Gly Asn Asp Thr Lys 705 710 715 720	2160
aac atc att aga gga ttg tcc cca aca ctg cct agc att acc aat gca Asn Ile Ile Arg Gly Leu Ser Pro Thr Leu Pro Ser Ile Thr Asn Ala 725 730 735	2208
ggt ggc gta cgc acc aca gaa cag ggc aat aca atc acc agc gac gaa Gly Gly Val Arg Thr Thr Glu Gln Gly Asn Thr Ile Thr Ser Asp Glu 740 745 750	2256
gac aaa tcc aaa gcc gcc agt atc ggt gat ata tta aat aca ggc ttt Asp Lys Ser Lys Ala Ala Ser Ile Gly Asp Ile Leu Asn Thr Gly Phe 755 760 765	2304

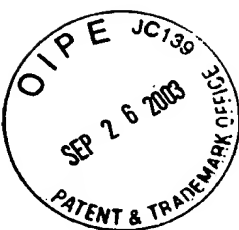
FIG.5I

aac cta aaa aat aat agc aac tcc gtt ggc ttt gtc tcc act tat aac	2352
Asn Leu Lys Asn Asn Ser Asn Ser Val Gly Phe Val Ser Thr Tyr Asn	
770 775 780	
act gtt gac ttt atc gat ggc aat gcc acc gcc acc gct aag gta act tac	2400
Thr Val Asp Phe Ile Asp Gly Asn Ala Thr Thr Ala Lys Val Thr Tyr	
785 790 795 800	
gat gaa acc aat caa acc agt aaa gta act tat gat gtc aat gtg gat	2448
Asp Glu Thr Asn Gln Thr Ser Lys Val Thr Tyr Asp Val Asn Val Asp	
805 810 815	
gag aaa acc att gaa ctc aca ggc gat aat ggc aag aca aac aaa att	2496
Glu Lys Thr Ile Glu Leu Thr Gly Asp Asn Gly Lys Thr Asn Lys Ile	
820 825 830	
ggc gtc aaa acc acc aca ctg acc aca aat gct aat ggt aaa gca	2544
Gly Val Lys Thr Thr Thr Leu Thr Thr Thr Asn Ala Asn Gly Lys Ala	
835 840 845	
acc aac ttt agt acc acc gat aac gat gcc ctt gtt aac gcc aaa gac	2592
Thr Asn Phe Ser Thr Thr Asp Asn Asp Ala Leu Val Asn Ala Lys Asp	
850 855 860	

RECEIVED

OCT 02 2003

CH CENTER 1600/2900

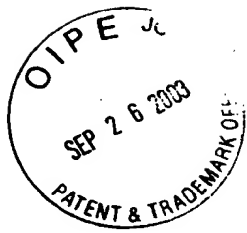




RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.5J

atc gcc gaa aat cta aac acc cta gcc aag gaa att cac acc acc aaa	2640
Ile Ala Glu Asn Leu Asn Thr Leu Ala Lys Glu Ile His Thr Thr Lys	
865	870
ggc aca gca gac acc gcc cta caa acc ttt aaa gtc aaa gac ggt	2688
Gly Thr Ala Asp Thr Ala Leu Gln Thr Phe Lys Val Lys Lys Asp Gly	
885	890
gca act gat gac gaa acc atc acc gtg ggt aaa gat ggt aca caa aac	2736
Ala Thr Asp Asp Glu Thr Ile Thr Val Gly Lys Asp Gly Thr Gln Asn	
900	905
ggc aag acc gtc aac act cta aaa ctc aaa ggt gaa aac ggt cta acg	2784
Gly Lys Thr Val Asn Thr Leu Lys Leu Lys Gly Glu Asn Gly Leu Thr	
915	920
gtt gct acc aat aaa gat ggt acg gtt acc ttt ggc att aac acc caa	2832
Val Ala Thr Asn Lys Asp Gly Thr Val Thr Phe Gly Ile Asn Thr Gln	
930	935
agc ggt ctt aaa gcc ggc gac agc acc act cta aac aaa gat ggc ttg	2880
Ser Gly Leu Lys Ala Gly Asp Ser Thr Thr Leu Asn Lys Asp Gly Leu	
945	950
	955
	960



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.5K

tct att aaa aac ccc gct agt aac gaa caa atc caa gtc ggt gct gat 2928  
Ser Ile Lys Asn Pro Ala Ser Asn Glu Gln Ile Gln Val Gly Ala Asp 965 970 975

ggc gtg aag ttt gcc aag gtt gat aag ggt aat tca agc act ggc att 2976  
Gly Val Lys Phe Ala Lys Val Asp Lys Gly Asn Ser Ser Thr Gly Ile 980 985 990

gat ggc aca agc cgt atc acc aaa gat caa att ggc ttt act ggg gct 3024  
Asp Gly Thr Ser Arg Ile Thr Lys Asp Gln Ile Gly Phe Thr Gly Ala 995 1000 1005

aat ggc tca ctt gat acc acc aaa ccc cac cta acc aaa gac aag ctt 3072  
Asn Gly Ser Leu Asp Thr Thr Lys Pro His Leu Thr Lys Asp Lys Leu 1010 1015 1020

aaa gtg ggt gaa gtt gaa att acc aac act ggc att aac gca ggt ggt 3120  
Lys Val Gly Glu Val Glu Ile Thr Asn Thr Gly Ile Asn Ala Gly Gly 1025 1030 1035 1040

aaa aag att acc aac att caa tca ggt gat att acc caa aac agc aat 3168  
Lys Lys Ile Thr Asn Ile Gln Ser Gly Asp Ile Thr Gln Asn Ser Asn 1045 1050 1055



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.5L

gat gct gtg aca ggc ggt cgg gtt tat gat tta aaa acc gaa ctt gaa 3216  
Asp Ala Val Thr Gly Gly Arg Val Tyr Asp Leu Lys Thr Glu Leu Glu  
1060 1065 1070

agc aaa atc aac agt gct gct aaa aca gca caa aac tca tta cac gaa 3264  
Ser Lys Ile Asn Ser Ala Ala Lys Thr Ala Gln Asn Ser Leu His Glu  
1075 1080 1085

ttc tca gta gca gat gaa caa ggt aat cac ttt acg gtt agt aac cct 3312  
Phe Ser Val Ala Asp Glu Gln Gly Asn His Phe Thr Val Ser Asn Pro  
1090 1095 1100

tac tcc agt tat gac acc tca aag acc tct gat gtc atc acc ttt gca 3360  
Tyr Ser Ser Tyr Asp Thr Ser Lys Thr Ser Asp Val Ile Thr Phe Ala  
1105 1110 1115 1120

ggt gaa aac ggc att acc acc aag gta aat aaa ggt gtg cgt gtg 3408  
Gly Glu Asn Gly Ile Thr Thr Lys Val Asn Lys Gly Val Val Arg Val  
1125 1130 1135

ggc att gac caa acc aaa ggc tta acc acg cct aag ctg acc gtg ggt 3456  
Gly Ile Asp Gln Thr Lys Gly Leu Thr Thr Pro Lys Leu Thr Val Gly  
1140 1145 1150

# FIG.5M

aat aat aat ggc aaa ggc att gtc att gac agt aaa gat ggt caa aat Asn Asn Asn Gly Lys Gly Ile Val Ile Asp Ser Lys Asp Gly Gln Asn 1155 1160 1165	3504
acc atc aca gga cta agc aac act cta gct aat gtt acc aat gat ggt Thr Ile Thr Gly Leu Ser Asn Thr Leu Ala Asn Val Thr Asn Asp Gly 1170 1175 1180	3552
gca gga cac gca cta agc caa ggg ctt gcc aat gac acc gac aaa acc Ala Gly His Ala Leu Ser Gln Gly Leu Ala Asn Asp Thr Asp Lys Thr 1185 1190 1195 1200	3600
cgt gcc gcc agc att ggt gat gtg cta aac gca ggc ttt aac ttg caa Arg Ala Ala Ser Ile Gly Asp Val Leu Asn Ala Gly Phe Asn Leu Gln 1205 1210 1215	3648
ggc aat ggt gaa gcg gtt gac ttt gtc tcc act tat gac act gtt gac Gly Asn Gly Glu Ala Val Asp Phe Val Ser Thr Tyr Asp Thr Val Asp 1220 1225 1230	3696
ttt atc gat ggc aat gcc acc acc gct aag gtg acc tat gat gac aca Phe Ile Asp Gly Asn Ala Thr Thr Ala Lys Val Thr Tyr Asp Asp Thr 1235 1240 1245	3744

RECEIVED

OCT 02 2003

TECH CENTER 1600/2900





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.5N

agc aaa acc agt aaa gtg gtc tat gat gtc aat gtg gat aat aaa acc 3792  
Ser Lys Thr Ser Lys Val Val Tyr Asp Val Asn Val Asp Asn Lys Thr  
1250 1255 1260

att gaa gtg aca agt gat aaa aaa ctt ggc gtc aaa acc acc aca ctg 3840  
Ile Glu Val Thr Ser Asp Lys Lys Leu Gly Val Lys Thr Thr Thr Leu  
1265 1270 1275 1280

acc aaa aca agt gct aat ggt aat gca acc aaa ttt agt gcc gcc gat 3888  
Thr Lys Thr Ser Ala Asn Gly Asn Ala Thr Lys Phe Ser Ala Ala Asp  
1285 1290 1295

ggc gat gcc ctt gtt aaa gcc agt gat atc gcc acc cat cta aat acc 3936  
Gly Asp Ala Leu Val Lys Ala Ser Asp Ile Ala Thr His Leu Asn Thr  
1300 1305 1310

ttg gct ggc gac atc caa acc gcc aaa ggg gca agc caa gca agc agc 3984  
Leu Ala Gly Asp Ile Gln Thr Ala Lys Gly Ala Ser Gln Ala Ser Ser  
1315 1320 1325

tca gca agc tat gtg gat gct gat ggc aac aag gtc atc tat gac agt 4032  
Ser Ala Ser Tyr Val Asp Ala Asp Gly Asn Lys Val Ile Tyr Asp Ser  
1330 1335 1340



RECEIVED

OCT 02 2003

ECH CENTER 1600/2900

## FIG.50

acc gat aag aag tac tat caa gtc aat gac aag ggt caa gtg gac aaa Thr Asp Lys Lys Tyr Tyr Gln Val Asn Asp Lys Gly Gln Val Asp Lys 1345 1350 1355 1360	4080
aac aaa gaa gtt gcc aaa gac aaa ctg gtc gcc caa gcc caa acc cca Asn Lys Glu Val Ala Lys Asp Lys Leu Val Ala Gln Ala Gln Thr Pro 1365 1370 1375	4128
gat gcc aca ttg gct caa atg aat gtc aaa tca gtc att aac aaa gag Asp Gly Thr Leu Ala Gln Met Asn Val Lys Ser Val Ile Asn Lys Glu 1380 1385 1390	4176
caa gta aat gat gcc aat aaa aag caa ggc atc aat gaa gac aac gcc Gln Val Asn Asp Ala Asn Lys Lys Gln Gly Ile Asn Glu Asp Asn Ala 1395 1400 1405	4224
ttt atc aaa ggg ctt gaa aac gcc gcc gcc aaa gac acc aaa acc aac Phe Ile Lys Gly Leu Glu Asn Ala Ala Lys Asp Thr Lys Thr Lys Asn 1410 1415 1420	4272
gcc gca gta act gtg ggt gat tta aat gcc gtt gcc caa aca cag ctg Ala Ala Val Thr Val Gly Asp Leu Asn Ala Val Ala Gln Thr Pro Leu 1425 1430 1435 1440	4320



FIG.5P

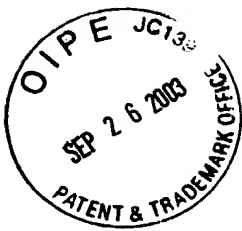
acc ttt gca ggg gat aca ggc aca acg gct aaa aaa ctg ggc gag act	4368
Thr Phe Ala Gly Asp Thr Gly Thr Thr Ala Lys Lys Leu Gly Glu Thr	
1445	1450
	1455
ttg acc atc aaa ggt ggg caa aca gac acc aat aag cta acc gat aat	4416
Leu Thr Ile Lys Gly Gly Gln Thr Asp Thr Asn Lys Leu Thr Asp Asn	
1460	1465
	1470
aac atc ggt gtg gta gca ggt act gat ggc ttc act gtc aaa ctt gcc	4464
Asn Ile Gly Val Val Ala Gly Thr Asp Gly Phe Thr Val Lys Leu Ala	
1475	1480
	1485
aaa gac cta acc aat ctt aac agc gtt aat gca ggt ggc acc aga att	4512
Lys Asp Leu Thr Asn Leu Asn Ser Val Asn Ala Gly Gly Thr Arg Ile	
1490	1495
	1500
gat gaa aaa ggc atc tct ttt gta gac gca aac ggt caa gcc aaa gca	4560
Asp Glu Lys Gly Ile Ser Phe Val Asp Ala Asn Gly Gln Ala Lys Ala	
1505	1510
	1515
	1520
aac acc cct gtg cta agt gcc aat ggg ctg gac ctg ggt ggc aaa cgc	4608
Asn Thr Pro Val Leu Ser Ala Asn Gly Leu Asp Leu Gly Gly Lys Arg	
1525	1530
	1535



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.5Q

atc agt aac atc ggt gca gct gtt gat gat aac gat gcg gtg aac ttt 4656  
Ile Ser Asn Ile Gly Ala Ala Val Asp Asp Asn Asp Ala Val Asn Phe  
1540 1545 1550

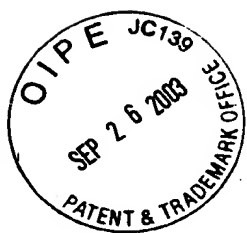
aag cag ttt aat gaa gtt gcc aaa acg gtc aac aac cta aac aac caa 4704  
Lys Gln Phe Asn Glu Val Ala Lys Thr Val Asn Asn Leu Asn Asn Gln  
1555 1560 1565

agt aac tca ggt gcg tca tta ccc ttt gtg gta acc gat gcc aat ggc 4752  
Ser Asn Ser Gly Ala Ser Leu Pro Phe Val Val Thr Asp Ala Asn Gly  
1570 1575 1580

aag ccc atc aat ggc acc gat ggc aag ccc caa aaa gcc atc aag ggc 4800  
Lys Pro Ile Asn Gly Thr Asp Gly Lys Pro Gln Lys Ala Ile Lys Gly  
1585 1590 1595 1600

gcc gat ggt aaa tac tat cac gcc aac gcc aac ggc gta cct gtg gac 4848  
Ala Asp Gly Lys Tyr Tyr His Ala Asn Ala Asn Gly Val Pro Val Asp  
1605 1610 1615

aaa gat ggc aag ccc atc acc gat gcg gac aaa ctt gcc aat ctg gca 4896  
Lys Asp Gly Lys Pro Ile Thr Asp Ala Asp Lys Leu Ala Asn Leu Ala  
1620 1625 1630



RECEIVED

OCT 02 2003

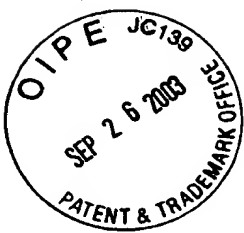
TECH CENTER 1600/2900

## FIG.5R

gct cat ggc aaa ccc ctt gat gca ggt cat caa gtg gtg gca agc cta Ala His Gly Lys Pro Leu Asp Ala Gly His Gln Val Val Ala Ser Leu 1635 1640 1645	4944
ggc ggc aac tca gat gcc atc acc cta acc aac atc aag tcc act ttg Gly Gly Asn Ser Asp Ala Ile Thr Leu Thr Asn Ile Lys Ser Thr Leu 1650 1655 1660	4992
cca caa att gac aca cca aac aca ggt aat gcc aat gca ggg caa gcc Pro Gln Ile Asp Thr Pro Asn Thr Gly Asn Ala Asn Ala Gly Gln Ala 1665 1670 1675 1680	5040
caa agt ctg ccc agc cta tca gca gca cag caa agt aat gct gcc agt Gln Ser Leu Pro Ser Leu Ser Ala Ala Gln Gln Ser Asn Ala Ala Ser 1685 1690 1695	5088
gtc aaa gat gtg cta aat gta ggc ttt aac ttg cag acc aat cac aat Val Lys Asp Val Leu Asn Val Gly Phe Asn Leu Gln Thr Asn His Asn 1700 1705 1710	5136
caa gtg gac ttt gtc aaa gcc tat gat acc gtc aac ttt gtc aat ggt Gln Val Asp Phe Val Lys Ala Tyr Asp Thr Val Asn Phe Val Asn Gly 1715 1720 1725	5184

# FIG.5S

aca ggt gcc gac atc aca agc gtg cgt agt gct gat ggc acg atg agt Thr Gly Ala Asp Ile Thr Ser Val Arg Ser Ala Asp Gly Thr Met Ser 1730 1735 1740	5232
aac atc acc gtc aac acc gcc tta gca gog acc gat gat ggc aat Asn Ile Thr Val Asn Thr Ala Leu Ala Thr Asp Asp Gly Asn 1745 1750 1755 1760	5280
gtg ctt atc aaa gcc aaa gat ggt aag ttc tac aaa gca gac gac ctc Val Leu Ile Lys Ala Lys Asp Gly Lys Phe Tyr Lys Ala Asp Asp Leu 1765 1770 1775	5328
atg cca aac ggc tca cta aaa gca ggc aaa tca gcc agt gat gcc aaa Met Pro Asn Gly Ser Leu Lys Ala Gly Lys Ser Ala Ser Asp Ala Lys 1780 1785 1790	5376
act cca act ggt cta agc ctt gtt aac ccc aat gct ggt aaa ggc agt Thr Pro Thr Gly Leu Ser Leu Val Asn Pro Asn Ala Gly Lys Gly Ser 1795 1800 1805	5424
aca ggc gat gca gtg gct ctt aat aac tta tca aaa gog gta ttt aaa Thr Gly Asp Ala Val Ala Leu Asn Asn Leu Ser Lys Ala Val Phe Lys 1810 1815 1820	5472



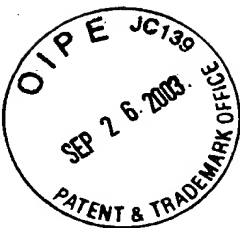
RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.5T

tcc aaa gat ggt aca act act acc aca gta agc tct gat ggc atc agt	5520
Ser Lys Asp Gly Thr Thr Thr Thr Val Ser Ser Asp Gly Ile Ser	
1825	1835
	1840
	1830
atc caa ggc aaa gat aac agc agc atc acc cta agc aaa gat ggg ctg	5568
Ile Gln Gly Lys Asp Asn Ser Ser Ile Thr Leu Ser Lys Asp Gly Leu	
1845	1850
	1855
aat gta ggc ggt aag gtc atc agc aat gtg ggt aaa ggc aca aaa gac	5616
Asn Val Gly Gly Lys Val Ile Ser Asn Val Gly Lys Gly Thr Lys Asp	
1860	1865
	1870
acc gac gct gcc aat gta caa cag tta aac gaa gta cgc aac ttg ttg	5664
Thr Asp Ala Ala Asn Val Gln Gln Leu Asn Glu Val Arg Asn Leu Leu	
1875	1880
	1885
ggt ctt ggt aat gct ggt aat gat aac gct gac ggc aat cag gta aac	5712
Gly Leu Gly Asn Ala Gly Asn Asp Asn Ala Asp Gly Asn Gln Val Asn	
1890	1895
	1900
att gcc gac atc aaa aaa gac cca aat tca ggt tca tct aac cgc	5760
Ile Ala Asp Ile Lys Lys Asp Pro Asn Ser Gly Ser Ser Asn Arg	
1905	1910
	1915
	1920



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

## FIG.5U

act gtc atc aaa gca ggc acg gta ctt ggc ggt aaa ggt aat aac gat Thr Val Ile Lys Ala Gly Thr Val Leu Gly Gly Lys Gly Asn Asn Asp 1925 1930 1935	5808
acc gaa aaa ctt gcc act ggt ggt gta caa gtg ggc gtg gat aaa gac Thr Glu Lys Leu Ala Thr Gly Gly Val Gln Val Gly Val Asp Lys Asp 1940 1945 1950	5856
ggc aac gct aac ggc gat tta agc aat gtt tgg gtc aaa acc caa aaa Gly Asn Ala Asn Gly Asp Leu Ser Asn Val Trp Val Lys Thr Gln Lys 1955 1960 1965	5904
gat ggc agc aaa aaa gcc ctg ctc gcc act tat aac gcc gca ggt cag Asp Gly Ser Lys Lys Ala Leu Leu Ala Thr Tyr Asn Ala Ala Gly Gln 1970 1975 1980	5952
acc aac tat ttg acc aac aac ccc gca gaa gcc att gac aga ata aat Thr Asn Tyr Leu Thr Asn Asn Pro Ala Glu Ala Ile Asp Arg Ile Asn 1985 1990 1995 2000	6000
gaa caa ggt atc ogc ttc ttc cat gtc aac gat ggc aat caa gag cct Glu Gln Gly Ile Arg Phe Phe His Val Asn Asp Gly Asn Gln Glu Pro 2005 2010 2015	6048

FIG.5V

gtg gta caa ggg cgt aac ggc att gac tca agt gcc tca ggc aag cac	6096
Val Val Gln Gly Arg Asn Gly Ile Asp Ser Ser Ala Ser Gly Lys His	
2020 2025 2030	
tca gtg gog ata ggt ttc cag gcc aag gca gat ggt gaa gcc gcc gtt	6144
Ser Val Ala Ile Gly Phe Gln Ala Lys Ala Asp Gly Glu Ala Ala Val	
2035 2040 2045	
gcc ata ggc aga caa acc caa gca ggc aac caa tcc atc gcc atc ggt	6192
Ala Ile Gly Arg Gln Thr Gln Ala Gly Asn Gln Ser Ile Ala Ile Gly	
2050 2055 2060	
gat aac gca caa gcc acg ggc gat caa tcc atc gcc atc ggt aca ggc	6240
Asp Asn Ala Gln Ala Thr Gly Asp Gln Ser Ile Ala Ile Gly Thr Gly	
2065 2070 2075 2080	
aat gtg gta aca ggt aag cac tct ggt gcc atc ggc gac cca agc act	6288
Asn Val Val Thr Gly Lys His Ser Gly Ala Ile Gly Asp Pro Ser Thr	
2085 2090 2095	
gtt aag gct gat aac agt tac agt gtg ggt aat aac aac cag ttt atc	6336
Val Lys Ala Asp Asn Ser Tyr Ser Val Gly Asn Asn Gln Phe Ile	
2100 2105 2110	



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.5W

gat gcc act cag acc gat gtc ttt ggt gtg ggc aat aac atc acc gtg 6384  
Asp Ala Thr Gln Thr Asp Val Phe Gly Val Gly Asn Ile Thr Val  
2115 2120 2125

acc gaa agt aac tog gtt gcc tta ggt tca aac tct gcc atc agt gca 6432  
Thr Glu Ser Asn Ser Val Ala Leu Gly Ser Asn Ser Ala Ile Ser Ala  
2130 2135 2140

ggc aca cac gca ggc aca caa gcc aaa aaa tct gac ggc aca gca ggt 6480  
Gly Thr His Ala Gly Thr Gln Ala Lys Lys Ser Asp Gly Thr Ala Gly  
2145 2150 2155 2160

aca acc acc aca gca ggt gca aca ggt acg gtt aaa ggc ttt gct gga 6528  
Thr Thr Thr Ala Gly Ala Thr Gly Thr Val Lys Gly Phe Ala Gly  
2165 2170 2175

caa acg gcg gtt ggt gcg gtc tcc gtg ggt gcc tca ggt gct gaa cgc 6576  
Gln Thr Ala Val Gly Ala Val Ser Val Gly Ala Ser Gly Ala Glu Arg  
2180 2185 2190

cgt atc caa aat gtg gca gca ggt gag gtc agt gcc acc agc acc gat 6624  
Arg Ile Gln Asn Val Ala Ala Gly Glu Val Ser Ala Thr Ser Thr Asp  
2195 2200 2205





RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# FIG.5X

gog gtc aat ggt agc cag ttg tac aaa gcc acc caa ggc att gcc aac 6672  
Ala Val Asn Gly Ser Gln Leu Tyr Lys Ala Thr Gln Gly Ile Ala Asn  
2210 2215 2220

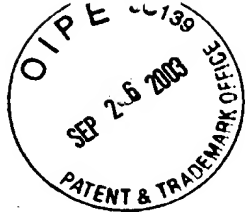
gca acc aat gag ctt gac cat cgt atc cac caa aac gaa aat aaa gcc 6720  
Ala Thr Asn Glu Leu Asp His Arg Ile His Gln Asn Glu Asn Lys Ala  
2225 2230 2235 2240

aat gca ggg att tca tca gog atg gog atg gog tcc atg cca caa gcc 6768  
Asn Ala Gly Ile Ser Ser Ala Met Ala Met Ala Ser Met Pro Gln Ala  
2245 2250 2255

tac att cct ggc aga tcc atg gtt acc ggg ggt att gcc acc cac aac 6816  
Tyr Ile Pro Gly Arg Ser Met Val Thr Gly Gly Ile Ala Thr His Asn  
2260 2265 2270

ggt caa ggt gog gtg gca gtg gga ctg tog aag ctg tog gat aat ggt 6864  
Gly Gln Gly Ala Val Ala Val Gly Leu Ser Lys Leu Ser Asp Asn Gly  
2275 2280 2285

caa tgg gta ttt aaa atc aat ggt tca gcc gat acc caa ggc cat gta 6912  
Gln Trp Val Phe Lys Ile Asn Gly Ser Ala Asp Thr Gln Gly His Val  
2290 2295 2300



RECEIVED

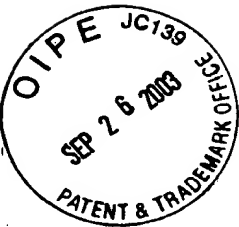
OCT 02 2003

TECH CENTER 1600/2900

FIG.5Y

999 gcg gca gtt ggt gca ggt ttt cac ttt  
Gly Ala Ala Val Gly Ala Gly Phe His Phe  
2305 2310

6942



RECEIVED

OCT 02 2003

ECH CENTER 1600/2900

FIG.6A

Alignment of amino acid sequence of 200kDa proteins of *M. catarrhalis* strains

10	20	30	40	50	60	...	
MNHIYKVIENKATGTFMAVEYAKSHSTGGSCATGQVGSVCITLSFARIAALAVLVIGATLSGS...							
.....R.....N.....							
.....C.....G.SS.STA.....SPVIRLT.V.T.I.....N.....							
...	70	80	90	100			
...AYAQKDKTKHIAIGEONQPRRS--GTAKADGDRAIAIG							
.....QIT...-E..QT.KINNTLK.D.L.T.EAS..F.							
.....NNSK--...F.TTGNDNA-----S.SNEAS.....							
						4223 Q8 LES-1	
110	120	130	140	150	160	...	
ENANAQCGQAIAIGSSNKTVNGSSLD-KIGTDATQESIAIGDVKASGDASIAIGSDDLHLLD...							
SLSK...S.....VKPDP.NG.NG-NV.SH.K.N.....L.E.....Y.PK...							
SL.K.HAN.....G.KPDPNRQAAHQ.A.SH.K.K.....L.E.....Y.DR...							
...	170	180	190	200			
...QHGNPKHPKGTLLINDLINGHAVLKEIRSSKNDVKYR							
...NLDL-NEFHK----.H..EI..K.QT.T.GKI...							
...NST.S.Y.N.L.ST-..QN.T..RQ..D.NGSQ-....							
						4223 Q8 LES-1	
210	220	230	240	250	260	...	
RTTASGHASTAVGAMSYAQGHFSNAFGTRATAKSAYSLAVGLAATAEQSTIAIGSDATSSSLG...							
...R.Q.....Y...EA.....Q.TK.S.V.N.KANAF...							
...A.E.....A.K...A.....S.EGN.....T.K.KGY.....N.QAINY....							



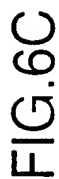
FIG.6B

...	270	280	290	300	
...AIALGAGTRAQLOGSIALGQGSVVTQSDNN-SRPAYT					4223
...T.I.GN.VVN.GRGV...F..QILDR...TDAS..V					Q8
...L....D..VD.DYG....Y..QIILNN..NNK..V					LES-1
310	320	330	340	350	...
PNTQALDPKFQ--ATNNIKAGPL-SIG-SN-----SIKRKIINVGAGVKNKTDVAVNVAQLEAVVKW...					
.LGKT.ADQYK--..RQGDSTIDIF...N..NNNS..R.....SRD.....KL.FEEL....					
.EGNGSNIKSS-K...----GNG.F...-----SST.....YED.....K..ENL....					
...	360	370	380	390	400
...AKERRTFQGD-DN-STDVKIGLDNLTIKGGAETNA--LTDNN-IGV					4223
...-N.K...K..G..N.NS.ER..G.....D.Q...--..EA.-.....					Q8
.....-Q...K...-..-G.G..KK.GE.....-..Q.DK.....N.....					LES-1
410	420	430	440	450	460
...	...	...	...	...	...
KEADNSGLKVKLAKTILNLTENVNTTILNATTIVKVGSSSTTAEILLSDSLTFTQPNIGSQSTSK...					
TDGN--.....E.TG..S.-----S..NKIT.SNTNNN...Q.GG...S-.I..TK-.D....					
TDNN-T.....N.SG.ET.S.KN.T.SEK.T...GN-.....Q.GG.....-..T.NA-.D.....					
...	470	480	490	500	
...TVYGVNGVKFTINNAETTAAGTIRITRDKIGFARDG					4223
.....SID.L.....DSNSI.TK.....KK.....GTIN					Q8
.....TD.L...D.SN.ALED-.....K.....SNKA					LES-1

RECEIVED

OCT 02 2003

TECH CENTER 1600/2900



540 550 560 570 580 590 ...  
 GNKKISNLAKGSSANDAVTIEQLKAAKPTILNAGAGISVTPTEISVDAKSGNVAPTNYIGVKTT...  
 ...H..TG.TN.IANT.....K..D.....D...INSNGDLVDS...I.T.....S.....  
 .DQ....VKDATDDT....YK.....-----

```

610      620      630      640      650      660
TSD--KFSVKGSGTINSLVTAHSLASYINEVNRFTADSALQSFVKEEDDDANAITVAKDTKN...
...GNN...SNAHD.....KD.D.K.E.....P.K.QNG-.NSN.....G.--....
-----O.OOD.G.....SIRD.-KGQEFF.SNLYSNGENT...

```

TECH CENTER 1600/2900



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.6D

...	670	680	690	700	
...	AGAVSILKLGKNGLTVA	TKD-GT	VTFGLSQDSGL	FTIG	4223
...	GKTFNT	...	E..VNIT.NRAT	...	Q8
...	PNIFETITFA.E..	ISISNDIAK.K.KV.	IDPIN...	TP	IES-1

710	720	730	740	750	...	
KST	-----	LNNDGLTVKDINEQ	IQV--	GANGIKFTNWG	SNPGTIGIANI	TRDKIGFA...
.L.VGSDIN	-----	NR-LV-I..VP-SADG	ST.NIIR	-----	...	
.L.VGSDKD	-----	K.QLV-I..VASG	---DT.NIIR	-----	...	
...	...	760	770	780	790	800
...	GSDGAVDINKPYLDQ	KLQVGNWKITN	GINAGKAITGLSPTL	PSI	4223	
...	-----	-----	-----	-----	Q8	
...	-----	-----	-----	-----	IES-1	

810	820	830	840	850	860	...
ADQSS-RNIELGNTIQ-DKDKSNAASINDI	LTNGENLKNNNPIDFVSTYD	IVDFANGVATTAT...				
.SP.G-...A...E-E.....D.V.A.....GKDK.....T...ID.....						
TNAGGV.TT.Q....TS.E...K....G.....S.SVG.....NT...ID.....K...						



FIG.6E

... 870 880 890 900  
... VTHDTANKTSKWVDVNDVDDTTHLTGTDNKK---LGKVT  
... Y.E..Q...A...EK.E...--G.KQ-.....  
... Y.ET.Q...T...EK.E...--G.TNKI.....

4223  
Q8  
LES-1

910 920 930 940 950 960 ...  
TKLNKTSANGTAINFNSSDED-ALVNAKDIAENLTLAKEIHTTKGTADTALQIFIVKKVD...  
I..TE..T...-T...-T.D.H...K.S...G...E...N...  
T.TT.N...K-...--STT.N.-.....K....--...

... 970 980 990 1000  
... ENNADANAI TVGQKNANQ--VNILTLKGENLNKT  
... DK...T...KDGTSK--...K...K...D...  
... --DG.T.DET...KDGTO.GKT...K.....TVA.

4223  
Q8  
LES-1

1010 1020 1030 1040 1050 1060 ...  
DKNGTVFGINTTSLKAGKST-LNDGSLIKNPTGSEIQVGADGVKFAKVNNGVWAGIDG...  
...D.....Q.....D.T.NN.....TASN.....M.....  
N.D.....Q.....D.T.KD.....ASN.....DK-.NSST.....

... 1070 1080 1090 1100  
... TTRITRDEIGFTGTNGSLDKSPHLSKDGINAGGKI-----  
... S...K.Q...A...TT...T..KLKV.EVE.TNIGINAGGKI-----

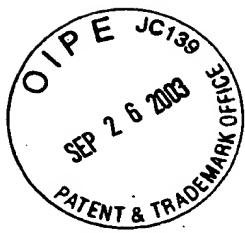
4223  
Q8  
LES-1

RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.6F



1110 1120 1130 1140 1150 1160 ...  
TNIQSGEIAQNSHDAVTGCKIYDLKTELENKISSAKTAQNSLHEFSVADEQCGNFTVSNPYSS...  
.....K.....  
.....D.T...N.....RV.....S.N.A.....H.....  
... 1170 1180 1190 1200  
...YDTSKTSQVITFAGENGITTKVANKGVVRVGIDQTKG  
.....  
.....

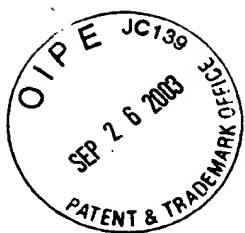
4223  
Q8  
LES-1

1210 1220 1230 1240 1250 1260 ...  
LTTPKLTVGNNGKIVIDSQNGQNTTGLSNTLANVTNDKGSVRTTEQGNLIKDEDKTRAASI...  
.....N.....  
.....KD.....-AGHALS..LAN-.T.....  
... 1270 1280 1290 1300  
...VDVLSAGFNLOQNGEAVDFVSTYDITVNFADGNVATTA  
.....N.T...  
...G..N.....D.I.....

4223  
Q8  
LES-1

RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900





RECEIVED

OCT 02 2003

LEON CENTER 1600/2900

FIG.6G

1310	1320	1330	1340	1350	1360	...
KVTYDDTSKTSKVVDVNVDDTTIEVK-DKRLGVKTTTLTSTGKANKFALSNOATGDALVKAS...						
.....						
.....NK.....TS.....K.SANG.ATKF.A-.D.....						
...	1370	1380	1390	1400		
...DIVAHNLTLSGDIQTAKGASQANNSAGYVDADGNKVI						
.....						
.....AT.....A.....SS.S.....						

4223  
Q8  
IES-1

1410	1420	1430	1440	1450	1460	...
YDSTDNKYQAKNDGTVDKTKEVAKDKLVAAQQTDPDGTLAQMNVKSVINKEQVNDANKKQGINE...						
.....						
.....K....VNDK.Q...N.....						
...	1470	1480	1490	1500		
...DNAFVKGLEKAAASDNKTNAAVTVGDILNAVAQTPLT						
.....						
.....I...N.K.T.....						

4223  
Q8  
IES-1



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.6H

1510 1520 1530 1540 1550 1560 ...  
FAGDIGTTAKLGEITLIKGGQIDINKLTNNIGWAGIDGFTVKLAKDLTNLNSVAGGKID...  
.....  
.....R.....  
... 1570 1580 1590  
...DKGVSFVDSSGOAKANTPVL SANGLDL-----  
...E..I....AN.....  
...E..I....AN.....GGKRI

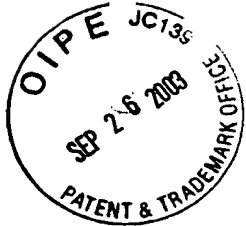
4223  
Q8  
LES-1

-----  
-----  
SNIGAAVDDNDAVNFKQFNEVAKTVNNLNQNSGASLPFVVTDANGKPTINGTDGKPKQKAIKGA...  
...-----  
...-----  
...DGKYYHANANGVPVDKDGKPTTDADKLANLAHGKP

4223  
Q8  
LES-1

-----  
-----  
LDAGHQVWASLGCNSDAITLTNIKSTLPQIDTFNIGNAGQAQSLPSLSAAQQAQSNVSVKDV...

FIG.6I



4223  
Q8  
LES-1

...  
...  
...NVGFNLQTNHNOVDFVKAYDTVNFVNGTGADITSVR

4223  
Q8  
LES-1

...  
...  
SADGTMSTNTVNTALAAATDDGNNLIIKAKDGKFKYKADDIMFNGSLKAGKSASDAKTPPTGLSLVN...  
...  
...  
...PNACKGSTGDAVALNNLSKAVFKSKDGTITTTIVSSD

1600

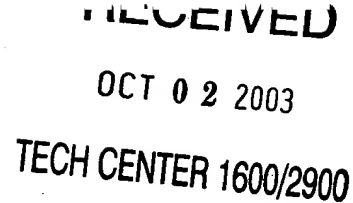
-----GKKVLSNVG

-----  
.....  
GISIQKDNSSITLSKDGLNV.....

4223  
Q8  
LES-1

...  
...  
...

RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



1610	1620	1630	1640	1650	1660	...
KGTIKDTDAANVQQLNEVRNLLGLGAGNDNADGNQVNIADIKKDPENSGSSNRIVIKAGTVLGG...						
.....	---	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
...	1670	1680	1690	1700		
...	KGNNDTEKLATGGIQVGVDKDGNANGDLSNWWKTQ					
.....	V.....					
.....	V.....					
.....	V.....					

1710	1720	1730	1740	1750	1760	...
KDGSKALLATYNAGQTNVLTNNPAFAIDRINEQGIRFFHVNDGNQEPVQGRNGIDSASCK...						
.....	V.....					
.....	...	1770	1780	1790	1800	
				HSVAIGFOAKADGEAAVAIGROTOAGNQSIAGINA		
				.....		
				.....		



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

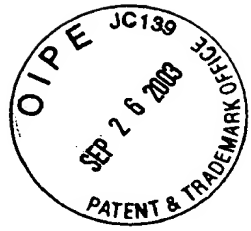
FIG.6K

1810 1820 1830 1840 1850 1860 ...  
QATGDQSLAIGTCNVWAGKHSGAIGDPSTVKADNSYSGNNQFTDATQIDVFGVGNITVITES...  
.....  
.....T.....  
.....I.....  
... 1870 1880 1890 1900  
...NSVALGNSAISAGTHAGTQAKKSDGTAGITTTAGA  
.....  
.....  
.....

4223  
Q8  
LES-1

1910 1920 1930 1940 1950 1960 ...  
TGTVKGFAGQTAVGAVSGASGAERRIQNVAAGEVSATSTDAVNGSQLYKATQSIANATNELDH...  
.....  
.....G.....  
... 1970 1980 1990 2000  
...RIHQENENKANAGISSAMAMASMPQAYIPGRSMVTGG  
.....  
.....

4223  
Q8  
LES-1



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.6L

2010	2020	2030	2040
IATHNGQGA	VAVGLSKL	SDNGQW	FKINGSADTQCHVGA
.....	.....	.....	VGAGFHF*
.....	.....	.....	.....*
.....	.....	.....	.....*
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

4223  
Q8  
LES-1



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

# Construction of Plasmids Expressing Portions of the 200 kDa Protein Gene from Strain 4223

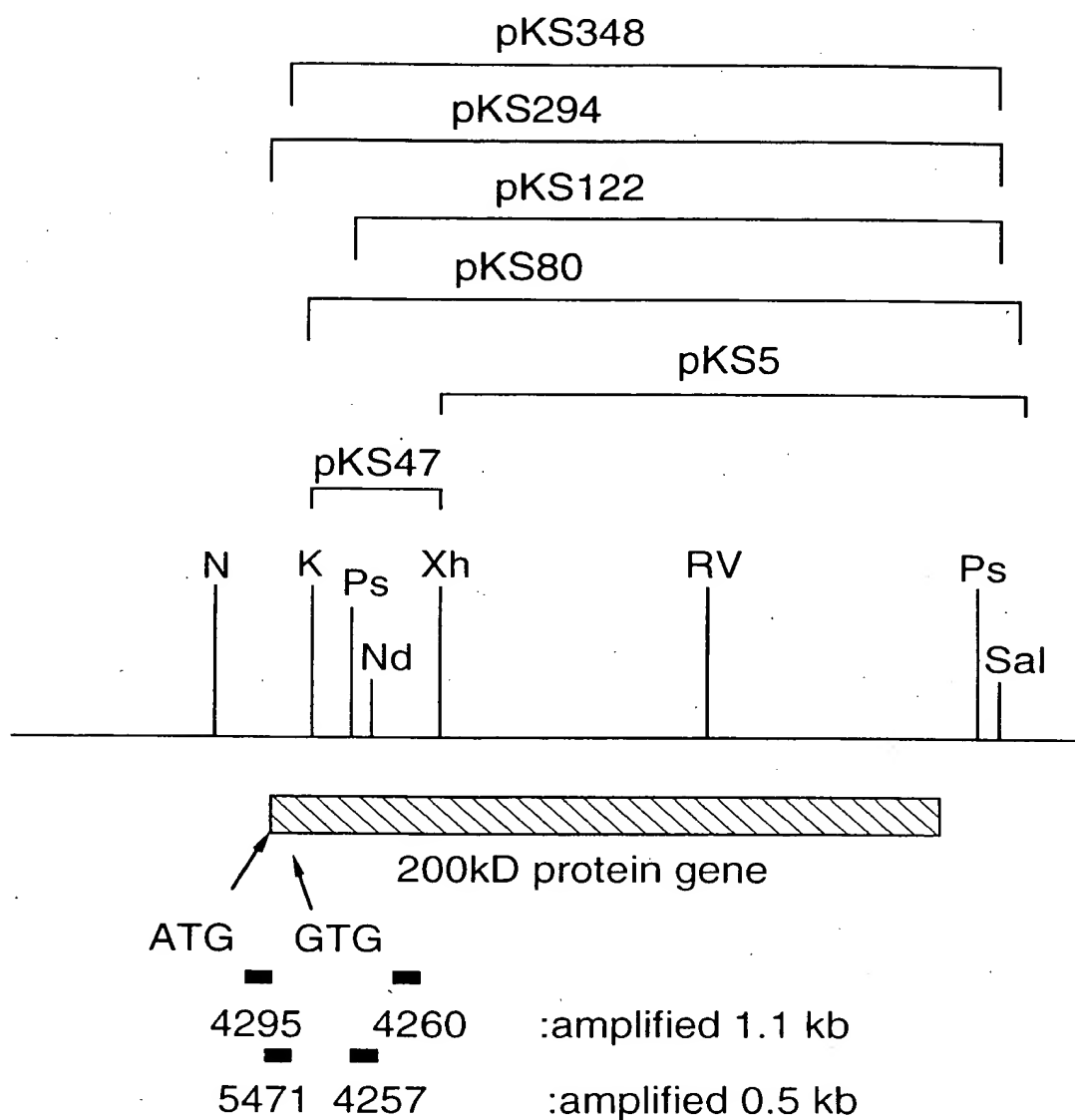


FIG.7



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

## FIG.8A

*M. catarrhalis* M56 200kDa gene in PKS348.

ATG atc ggt gca acg ctc agt ggc agt gct tat gct caa aaa aaa gat	48
Met Ile Gly Ala Thr Leu Ser Gly Ser Ala Tyr Ala Gln Lys Lys Asp	
1 5 10 15	
acc aaa cat atc gca att ggt gaa caa aac cag cca aga cgc tca ggc	96
Thr Lys His Ile Ala Ile Gly Glu Gln Asn Gln Pro Arg Arg Ser Gly	
20 25 30	
act gcc aag gcg gac ggt gat cga gcc att gct att ggt gaa aat gct	144
Thr Ala Lys Ala Asp Gly Asp Arg Ala Ile Ala Ile Gly Glu Asn Ala	
35 40 45	
aac gca cag ggc ggt caa gcc atc gcc atc ggt agt agt aat aaa act	192
Asn Ala Gln Gly Gly Gln Ala Ile Ala Ile Gly Ser Ser Asn Lys Thr	
50 55 60	
gtc aat gga agc agt ttg gat aag ata ggt acc gat gct acg ggt caa	240
Val Asn Gly Ser Ser Leu Asp Lys Ile Gly Thr Asp Ala Thr Gly Gln	
65 70 75 80	

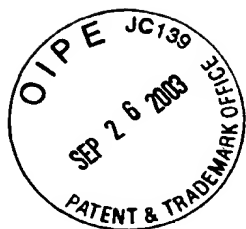


FIG.8B

gag tcc atc gcc atc ggt ggt gat gta aag gct agt ggt gat gcc tog	288
Glu Ser Ile Ala Ile Gly Gly Asp Val Lys Ala Ser Gly Asp Ala Ser	95
	85
	90
att gcc atc ggt agt gat gac tta cat ttg ctt gat cag cat ggt aat	336
Ile Ala Ile Gly Ser Asp Asp Leu His Leu Leu Asp Gln His Gly Asn	110
	100
	105
cct aaa cat cog aaa ggt act ctg att aac gat ctt att aac ggc cat	384
Pro Lys His Pro Lys Gly Thr Leu Ile Asn Asp Leu Ile Asn Gly His	125
	115
	120
gca gta tta aaa gaa ata cga agc tca aag gat aat gat gta aaa tat	432
Ala Val Leu Lys Glu Ile Arg Ser Ser Lys Asp Asn Asp Val Lys Tyr	140
	130
	135
aga cgc aca acc gca agc gga cac gcc agt act gca gtg gga gcc atg	480
Arg Arg Thr Thr Ala Ser Gly His Ala Ser Thr Ala Val Gly Ala Met	160
	145
	150
	155
tca tat gca cag ggt cat ttt tcc aac gcc ttt ggt aca ogg gca aca	528
Ser Tyr Ala Gln Gly His Phe Ser Asn Ala Phe Gly Thr Arg Ala Thr	175
	165
	170



RECEIVED  
OCT 02 2003  
TECH CENTER 1800/2900



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8C

gct aaa agt gcc tat toc ttg gca gtg ggt ctt gcc gcc aca gcc gag 576  
Ala Lys Ser Ala Tyr Ser Leu Ala Val Gly Leu Ala Ala Thr Ala Glu  
180 185 190

ggc caa tct aca atc gct att ggt tct gat gca aca tct agc tog ttg 624  
Gly Gln Ser Thr Ile Ala Ile Gly Ser Asp Ala Thr Ser Ser Ser Leu  
195 200 205

gga gog ata gcc ctt ggt gca ggt act cgt gct cag cta cag ggc agt 672  
Gly Ala Ile Ala Leu Gly Ala Gly Thr Arg Ala Gln Leu Gln Gly Ser  
210 215 220

att gcc cta ggt caa ggt tct gtt gtc act cag agt gat aat aat tct 720  
Ile Ala Leu Gly Gln Gly Ser Val Val Thr Gln Ser Asp Asn Ser  
225 230 235 240

aga cog gcc tat aca cca aat acc cag gca cta gac ccc aag ttt caa 768  
Arg Pro Ala Tyr Thr Pro Asn Thr Gln Ala Leu Asp Pro Lys Phe Gln  
245 250 255

gcc acc aat aat acg aag gog ggt cca ctt tcc att ggt agt aac tct 816  
Ala Thr Asn Asn Thr Lys Ala Ala Gly Pro Leu Ser Ile Gly Ser Asn Ser  
260 265 270



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8D

atc aaa cgt aaa atc atc atc gtc ggt gca ggt gtt aat aaa acc gat 864  
Ile Lys Arg Lys Ile Ile Asn Val Gly Ala Gly Val Asn Lys Thr Asp  
275 280 285

gog gtc aat gtg gca cag cta gaa gog gtg aag tgg gct aag gag 912  
Ala Val Asn Val Ala Gln Leu Glu Ala Val Lys Trp Ala Lys Glu  
290 295 300

cgt aga att act ttt cag ggt gat gat aac agt act gac gta aaa ata 960  
Arg Arg Ile Thr Phe Gln Gly Asp Asp Asn Ser Thr Asp Val Lys Ile  
305 310 315 320

ggt ttg gat aat act tta act att aaa ggt ggt gca gag acc aac gca 1008  
Gly Leu Asp Asn Thr Leu Thr Ile Lys Gly Gly Ala Glu Thr Asn Ala  
325 330 335

tta acc gat aat aat atc ggt gtg gta aaa gag gct gat aat agt ggt 1056  
Leu Thr Asp Asn Asn Ile Gly Val Val Lys Glu Ala Asp Asn Ser Gly  
340 345 350

ctg aaa gtt aaa ctt gct aaa act tta aac aat ctt act gag gtg aat 1104  
Leu Lys Val Lys Leu Ala Lys Thr Leu Asn Asn Leu Thr Glu Val Asn  
355 360 365

FIG.8E

aca act aca tta aat gcc aca acc aca gtt aag gta ggt agt agt agt	1152
Thr Thr Thr Leu Asn Ala Thr Thr Thr Val Lys Val Gly Ser Ser	
370	375
	380
agt act aca gct gaa tta ttg agt gat agt tta acc ttt acc cag ccc	1200
Ser Thr Thr Ala Glu Leu Leu Ser Asp Ser Leu Thr Phe Thr Gln Pro	
385	390
	395
	400
aat aca ggc agt caa agc aca agc aaa acc gtc tat ggc gtt aat ggg	1248
Asn Thr Gly Ser Gln Ser Thr Ser Lys Thr Val Tyr Gly Val Asn Gly	
405	410
	415
gtg aag ttt act aat aat gca gaa aca aca gca atc ggc act act	1296
Val Lys Phe Thr Asn Asn Ala Glu Thr Thr Ala Ala Ile Gly Thr Thr	
420	425
	430
cgt att acc aga gat aaa att ggc ttt gct cga gat ggt gat gtt gat	1344
Arg Ile Thr Arg Asp Lys Ile Gly Phe Ala Arg Asp Gly Asp Val Asp	
435	440
	445
gaa aaa caa gca cca tat ttg gat aaa aaa caa ctt aaa gtg ggt agt	1392
Glu Lys Gln Ala Pro Tyr Leu Asp Lys Lys Gln Leu Lys Val Gly Ser	
450	455
	460

RECEIVED

OCT 02 2003

TECH CENTER 1600/2900





RECEIVED

OCT 02 2003

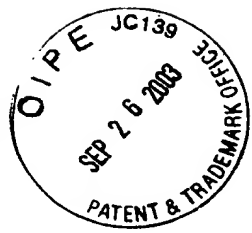
TECH CENTER 1600/2900

FIG.8F

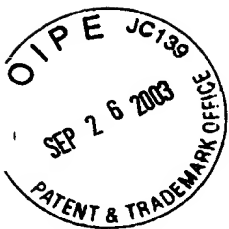
gtt gca att acc ata gac aat ggc att gat gca ggt aat aaa aag atc	1440
Val Ala Ile Thr Ile Asp Asn Gly Ile Asp Ala Gly Asn Lys Lys Ile	
465 470 475 480	
agt aat ctt gcc aaa ggt agc agt gct aac gat gog gtt acc atc gaa	1488
Ser Asn Leu Ala Lys Gly Ser Ser Ala Asn Asp Ala Val Thr Ile Glu	
485 490 495	
cag ctc aaa gcc gcc aag cct act tta aac gca ggc gct ggc atc agt	1536
Gln Leu Lys Ala Ala Lys Pro Thr Leu Asn Ala Gly Ala Gly Ile Ser	
500 505 510	
gtc aca cct act gaa ata tca gtt gat gct aag agt ggc aat gtt acc	1584
Val Thr Pro Thr Glu Ile Ser Val Asp Ala Lys Ser Gly Asn Val Thr	
515 520 525	
gcc cca act tac aac att ggc gtg aaa acc acc gag ctt aac agt gat	1632
Ala Pro Thr Tyr Asn Ile Gly Val Lys Thr Thr Glu Leu Asn Ser Asp	
530 535 540	
ggc act agt gat aaa ttt agt gtt aag ggt agt ggt acg aac aat agc	1680
Gly Thr Ser Asp Lys Phe Ser Val Lys Gly Ser Gly Thr Asn Asn Ser	
545 550 555 560	

FIG.8G

tta gtt acc gcc gaa cat ttg gca agc tat cta aat gaa gtc aat cga	1728
Leu Val Thr Ala Glu His Leu Ala Ser Tyr Leu Asn Glu Val Asn Arg	
565	570
575	
acc gct gac agt gct cta caa agc ttt acc gtt aaa gaa gaa gac gat	1776
Thr Ala Asp Ser Ala Leu Gln Ser Phe Thr Val Lys Glu Glu Asp Asp	
580	590
585	
gat gac gcc aac gct atc acc gtg gct aaa gat acg aca aaa aat gcc	1824
Asp Asp Ala Asn Ala Ile Thr Val Ala Lys Asp Thr Thr Lys Asn Ala	
595	605
610	
ggc gca gtc agc atc tta aaa ctc aaa ggt aaa aac ggt cta acg gtt	1872
Gly Ala Val Ser Ile Leu Lys Leu Lys Gly Lys Asn Gly Leu Thr Val	
615	620
625	
gct acc aaa aaa gat ggt acg gtt acc ttt ggg ctt agc caa gat agc	1920
Ala Thr Lys Lys Asp Gly Thr Val Thr Phe Gly Leu Ser Gln Asp Ser	
630	635
640	
ggt ctg acc att ggc aaa agc acc cta aac aac gat ggc ttg act gtt	1968
Gly Leu Thr Ile Gly Lys Ser Thr Leu Asn Asp Gly Leu Thr Val	
645	650
655	



RECEIVED  
OCT 02 2003  
TECH CENTER 16300



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.8H

aaa gat acc aac gaa caa atc caa gtc ggt gct aat ggc att aaa ttt	2016
Lys Asp Thr Asn Glu Gln Ile Gln Val Gly Ala Asn Gly Ile Lys Phe	
660 665 670	
act aat gtg aat ggt agt aat cca ggt act ggc att gca aat acc gct	2064
Thr Asn Val Asn Gly Ser Asn Pro Gly Thr Gly Ile Ala Asn Thr Ala	
675 680 685	
cgc att acc aga gat aaa att ggc ttt gct ggt tct gat ggt gca gtt	2112
Arg Ile Thr Arg Asp Lys Ile Gly Phe Ala Gly Ser Asp Gly Ala Val	
690 695 700	
gat aca aac aaa cct tat ctt gat caa gac aag cta caa gtt ggc aat	2160
Asp Thr Asn Lys Pro Tyr Leu Asp Gln Asp Lys Leu Gln Val Gly Asn	
705 710 715 720	
ggt aag att acc aac act ggc att aac gca ggt ggt aaa gcc atc aca	2208
Val Lys Ile Thr Asn Thr Gly Ile Asn Ala Gly Gly Lys Ala Ile Thr	
725 730 735	
ggg ctg toc cca aca ctg cct agc att gcc gat caa agt agc cgc aac	2256
Gly Leu Ser Pro Thr Leu Pro Ser Ile Ala Asp Gln Ser Ser Arg Asn	
740 745 750	



RECEIVED

OCT 02 2003

TECH CENTER 1600/2900

FIG.8I

ata gaa ctg ggc aat aca atc caa gac aaa gac aaa tcc aac gct gcc Ile Glu Leu Gly Asn Thr Ile Gln Asp Lys Asp Lys Ser Asn Ala Ala 755 760 765 2304
agc att aat gat ata tta aat aca ggc ttt aac cta aaa aat aat aac Ser Ile Asn Asp Ile Leu Asn Thr Gly Phe Asn Leu Lys Asn Asn Asn 770 775 780 2352
aac ccc att gac ttt gtc tcc act tat gac att gtt gac ttt gcc aat Asn Pro Ile Asp Phe Val Ser Thr Tyr Asp Ile Val Asp Phe Ala Asn 785 790 795 800 2400
ggc aat gcc acc gcc aca gta acc cat gat acc gct aac aaa acc Gly Asn Ala Thr Thr Ala Thr Val Thr His Asp Thr Ala Asn Lys Thr 805 810 815 2448
agt aaa gtg gta tat gat gtg aat gtg gat gat aca acc att cat cta Ser Lys Val Val Tyr Asp Val Asn Val Asp Asp Thr Thr Ile His Leu 820 825 830 2496
aca ggc act gat gac aat aaa aaa ctt ggc gtc aaa acc acc aaa ctg Thr Gly Thr Asp Asp Asn Lys Lys Leu Gly Val Lys Thr Thr Lys Leu 835 840 845 2544



FIG.8J

aac aaa aca agt gct aat ggt aat aca gca act aac ttt aat gtt aac	2592
Asn Lys Thr Ser Ala Asn Gly Asn Thr Ala Thr Asn Phe Asn Val Asn	
850 855 860	
tct agt gat gaa gat gcc ctt gtt aac gcc aaa gac atc gcc gaa aat	2640
Ser Ser Asp Glu Asp Ala Leu Val Asn Ala Lys Asp Ile Ala Glu Asn	
865 870 875 880	
cta aac acc cta gcc aag gaa att cac acc acc aaa ggc aca gca gac	2688
Leu Asn Thr Leu Ala Lys Glu Ile His Thr Thr Lys Gly Thr Ala Asp	
885 890 895	
acc gcc cta caa acc ttt acc gtt aaa aag gta gat gaa aat aat aat	2736
Thr Ala Leu Gln Thr Phe Thr Val Lys Lys Val Asp Glu Asn Asn Asn	
900 905 910	
gct gat gac gcc aac gcc atc acc gtg ggt caa aag aac gca aat aat	2784
Ala Asp Asp Ala Asn Ala Ile Thr Val Gly Gln Lys Asn Ala Asn Asn	
915 920 925	
caa gtc aac acc cta aca ctc aaa ggt gaa aac ggt ctt aat att aaa	2832
Gln Val Asn Thr Leu Thr Lys Lys Gly Glu Asn Gly Leu Asn Ile Lys	
930 935 940	



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8K

acc gac aaa aat ggt acg gtt acc ttt ggc att aac acc aca agc ggt	2880
Thr Asp Lys Asn Gly Thr Val Thr Phe Gly Ile Asn Thr Thr Ser Gly	945 950 955 960
ctt aaa gcc ggc aaa agc acc cta aac gac ggt ggc ttg tct att aaa	2928
Leu Lys Ala Gly Lys Ser Thr Leu Asn Asp Gly Gly Leu Ser Ile Lys	965 970 975
aac ccc act ggt agc gaa caa atc caa gtc ggt gct gat ggc gtg aag	2976
Asn Pro Thr Gly Ser Glu Gln Ile Gln Val Gly Ala Asp Gly Val Lys	980 985 990
ttt gcc aag gtt aat aat ggt gtt gta ggt gct ggc att gat ggc	3024
Phe Ala Lys Val Asn Asn Asn Gly Val Val Gly Ala Gly Ile Asp Gly	995 1000 1005
aca act cgc att acc aga gat gaa att ggc ttt act ggg act aat ggc	3072
Thr Thr Arg Ile Thr Arg Asp Glu Ile Gly Phe Thr Gly Thr Asn Gly	1010 1015 1020
toa ctt gat aaa agc aaa ccc cac cta agc aaa gac ggc att aac gca	3120
Ser Leu Asp Lys Ser Lys Pro His Leu Ser Lys Asp Gly Ile Asn Ala	1025 1030 1035 1040



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8L

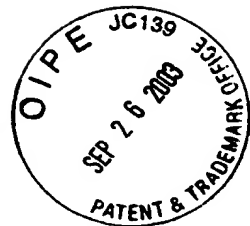
ggt ggt aaa aag att acc aac att caa tca ggt gag att gcc caa aac Gly Gly Lys Lys Ile Thr Asn Ile Gln Ser Gly Glu Ile Ala Gln Asn	1045 1050 1055	3168
agc cat gat gct gtg aca ggc ggc aag att tat gat tta aaa acc gaa Ser His Asp Ala Val Thr Gly Gly Lys Ile Tyr Asp Leu Lys Thr Glu	1060 1065 1070	3216
ctt gaa aac aaa atc agc agt act gcc aaa aca gca caa aac tca tta Leu Glu Asn Lys Ile Ser Ser Thr Ala Lys Thr Ala Gln Asn Ser Leu	1075 1080 1085	3264
cac gaa ttc tca gta gca gat gaa caa ggt aat aac ttt acg gtt agt His Glu Phe Ser Val Ala Asp Glu Gln Gly Asn Asn Phe Thr Val Ser	1090 1095 1100	3312
aac cct tac tcc agt tat gac acc tca aag acc tct gat gtc atc acc Asn Pro Tyr Ser Ser Tyr Asp Thr Ser Lys Thr Ser Asp Val Ile Thr	1110 1115 1120	3360
ttt gca ggt gaa aac ggc att acc acc aag gta aat aaa ggt gtg gtg Phe Ala Gly Glu Asn Gly Ile Thr Thr Lys Val Asn Lys Gly Val Val	1125 1130 1135	3408



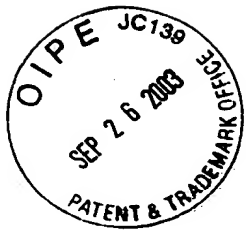
RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8M

cgt gtg ggc att gac caa acc aaa ggc tta acc acg cct aag ctg acc	3456
Arg Val Gly Ile Asp Gln Thr Lys Gly Leu Thr Pro Lys Leu Thr	
1140 1145 1150	
gtg ggt aat aat ggc aaa ggc att gtc att gac agc caa aat ggt	3504
Val Gly Asn Asn Gly Lys Gly Ile Val Ile Asp Ser Gln Asn Gly	
1155 1160 1165	
caa aat acc atc aca gga cta agc aac act cta gct aat gtt acc aat	3552
Gln Asn Thr Ile Thr Gly Leu Ser Asn Thr Leu Ala Asn Val Thr Asn	
1170 1175 1180	
gat aaa ggt agc gta cgc acc aca gaa cag ggc aat ata atc aaa gac	3600
Asp Lys Gly Ser Val Arg Thr Thr Glu Gln Gly Asn Ile Ile Lys Asp	
1185 1190 1195 1200	
gaa gac aaa acc cgt gcc gcc agc att gtt gat gtg cta agc gca ggc	3648
Glu Asp Lys Thr Arg Ala Ala Ser Ile Val Asp Val Leu Ser Ala Gly	
1205 1210 1215	
ttt aac ttg caa ggc aat ggt gaa gcg gtt gac ttt gtc tcc act tat	3696
Phe Asn Leu Gln Gly Asn Gly Glu Ala Val Asp Phe Val Ser Thr Tyr	
1220 1225 1230	



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8N

gac acc gtc aac ttt gcc gat ggc aat gcc acc acc gct aag gtc acc Asp Thr Val Asn Phe Ala Asp Gly Asn Ala Thr Thr Ala Lys Val Thr 1235 1240 1245	3744
tat gat gac aca agc aaa acc agt aaa gtc gtc tat gat gtc aat gtc Tyr Asp Asp Thr Ser Lys Thr Ser Lys Val Val Tyr Asp Val Asn Val 1250 1255 1260	3792
gat gat aca acc att gaa gtt aaa gat aaa aaa ctt ggc gta aaa acc Asp Asp Thr Thr Ile Glu Val Lys Asp Lys Lys Leu Gly Val Lys Thr 1265 1270 1275 1280	3840
acc aca ttg acc agt act ggc aca ggt gct aat aaa ttt gcc cta agc Thr Thr Leu Thr Ser Thr Gly Thr Gly Ala Asn Lys Phe Ala Leu Ser 1285 1290 1295	3888
aat caa gct act ggc gat ggc ctt gtc aag gcc agt gat atc gtt gct Asn Gln Ala Thr Gly Asp Ala Leu Val Lys Ala Ser Asp Ile Val Ala 1300 1305 1310	3936
cat cta aac acc tta tct ggc gac atc caa act gcc aaa ggg gca agc His Leu Asn Thr Leu Ser Gly Asp Ile Gln Thr Ala Lys Gly Ala Ser 1315 1320 1325	3984



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

## FIG.80

caa gog aac aac tca gca ggc tat gtg gat gct gat ggc aat aag gtc 4032  
Gln Ala Asn Asn Ser Ala Gly Tyr Val Asp Ala Asp Gly Asn Lys Val  
1330 1335 1340

atc tat gac agt acc gat aac aag tac tat caa gcc aaa aat gat ggc 4080  
Ile Tyr Asp Ser Thr Asp Asn Lys Tyr Tyr Gln Ala Lys Asn Asp Gly  
1345 1350 1355 1360

aca gtt gat aaa acc aaa gaa gtt gcc aaa gac aaa ctg gtc gcc caa 4128  
Thr Val Asp Lys Thr Lys Glu Val Ala Lys Asp Lys Leu Val Ala Gln  
1365 1370 1375

gcc caa acc cca gat ggc aca ttg gct caa atg aat gtc aaa tca gtc 4176  
Ala Gln Thr Pro Asp Gly Thr Leu Ala Gln Met Asn Val Lys Ser Val  
1380 1385 1390

att aac aaa gaa caa gta aat gat gcc aat aaa aag caa ggc atc aat 4224  
Ile Asn Lys Glu Gln Val Asn Asp Ala Asn Lys Lys Gln Gly Ile Asn  
1395 1400 1405

gaa gac aac gcc ttt gtt aaa gga ctt gaa aaa gcc gct tct gat aac 4272  
Glu Asp Asn Ala Phe Val Lys Gly Leu Glu Lys Ala Ala Ser Asp Asn  
1410 1415 1420



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8P

aaa acc aaa aac gcc gca gta act gtg ggt gat tta aat gcc gtt gcc 4320  
Lys Thr Lys Asn Ala Ala Val Thr Val Gly Asp Leu Asn Ala Val Ala  
1425 1430 1435 1440  
caa aca cog ctg acc ttt gca ggg gat aca ggc aca acg gct aaa aaa 4368  
Gln Thr Pro Leu Thr Phe Ala Gly Asp Thr Gly Thr Thr Ala Lys Lys  
1445 1450 1455  
ctg ggc gag act ttg acc atc aaa ggt ggg caa aca gac acc aat aag 4416  
Leu Gly Glu Thr Leu Thr Ile Lys Gly Gly Gln Thr Asp Thr Asn Lys  
1460 1465 1470  
cta acc gat aat aac atc ggt gtg gta gca ggt act gat ggc ttc act 4464  
Leu Thr Asp Asn Ile Gly Val Val Ala Gly Thr Asp Gly Phe Thr  
1475 1480 1485  
gtc aaa ctt gcc aaa gac cta acc aat ctt aac agc gtt aat gca ggt 4512  
Val Lys Leu Ala Lys Asp Leu Thr Asn Leu Asn Ser Val Asn Ala Gly  
1490 1495 1500  
ggc acc aaa att gat gac aaa ggc gtg tct ttt gta gac tca agc ggt 4560  
Gly Thr Lys Ile Asp Asp Lys Gly Val Ser Phe Val Asp Ser Ser Gly  
1505 1510 1515 1520

FIG.8Q

caa gcc aaa gca aac acc cct gtg cta agt gcc aat ggg ctg gac ctg	4608
Gln Ala Lys Ala Asn Thr Pro Val Leu Ser Ala Asn Gly Leu Asp Leu	1535
	1525
	1530
ggg ggc aag gtc atc agt aat gtg ggc aaa ggc aca aaa gat acc gac	4656
Gly Gly Lys Val Ile Ser Asn Val Gly Lys Gly Thr Lys Asp Thr Asp	1550
	1540
	1545
gct gcc aat gta caa cag tta aac gaa gta cgc aac ttg ttg ggt ctt	4704
Ala Ala Asn Val Gln Gln Leu Asn Glu Val Arg Asn Leu Leu Gly Leu	1565
	1555
	1560
ggg aat gct ggt aat gat aac gct gac ggc aat cag gta aac att gcc	4752
Gly Asn Ala Gly Asn Asp Asn Ala Asp Gly Asn Gln Val Asn Ile Ala	1580
	1570
	1575
gac atc aaa gac cca aat tca ggt tca tct aac cgc act gtc	4800
Asp Ile Lys Lys Asp Pro Asn Ser Gly Ser Ser Ser Asn Arg Thr Val	1600
	1585
	1590
atc aaa gca ggc acg gta ctt ggc ggt aaa ggt aat aac gat acc gaa	4848
Ile Lys Ala Gly Thr Val Leu Gly Gly Lys Gly Asn Asn Asp Thr Glu	1615
	1605
	1610

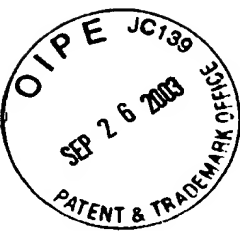


RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



FIG.8R

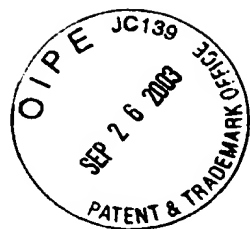
aaa ctt gcc act ggt ggt ata caa gtg ggc ggc gat aaa gac ggc aac Lys Leu Ala Thr Gly Gly Ile Gln Val Gly Val Asp Lys Asp Gly Asn 1620 1625 1630	4896
gct aac ggc gat tta agc aat gtt tgg gtc aaa acc caa aaa gat ggc Ala Asn Gly Asp Leu Ser Asn Val Trp Val Lys Thr Gln Lys Asp Gly 1635 1640 1645	4944
agc aaa aaa gcc ctg ctc gcc act tat aac gcc gca ggt cag acc aac Ser Lys Lys Ala Leu Leu Ala Thr Tyr Asn Ala Ala Gly Gln Thr Asn 1650 1655 1660	4992
tat ttg acc aac aac ccc gca gaa gcc att gac aga ata aat gaa caa Tyr Leu Thr Asn Asn Pro Ala Glu Ala Ile Asp Arg Ile Asn Glu Gln 1665 1670 1675 1680	5040
ggt atc cgc ttc ttc cat gtc aac gcc gat ggc aat caa gag cct gtg gta Gly Ile Arg Phe Phe His Val Asn Asp Gly Asn Gln Glu Pro Val Val 1685 1690 1695	5088
caa ggg cgt aac ggc att gac tca agt gcc tca ggc aag cac tca gtg Gln Gly Arg Asn Gly Ile Asp Ser Ser Ala Ser Gly Lys His Ser Val 1700 1705 1710	5136



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8S

gag ata ggt ttc cag gcc aag gca gat ggt gaa gcc gcc gtt gcc ata Ala Ile Gly Phe Gln Ala Lys Ala Asp Gly Glu Ala Ala Val Ala Ile 1715 1720 1725	5184
ggc aga caa acc caa gca ggc aac caa tcc atc gcc atc ggt gat aac Gly Arg Gln Thr Gln Ala Gly Asn Gln Ser Ile Ala Ile Gly Asp Asn 1730 1735 1740	5232
gca caa gcc acg ggc gat caa tcc atc gcc atc ggt aca ggc aat gtg Ala Gln Ala Thr Gly Asp Gln Ser Ile Ala Ile Gly Thr Gly Asn Val 1745 1750 1755 1760	5280
gta gca ggt aag cac tct ggt gcc atc ggc gac cca agc act gtt aag Val Ala Gly Lys His Ser Gly Ala Ile Gly Asp Pro Ser Thr Val Lys 1765 1770 1775	5328
gct gat aac agt tac agt gtg ggt aat aac aac cag ttt acc gat gcc Ala Asp Asn Ser Tyr Ser Val Gly Asn Asn Asn Gln Phe Thr Asp Ala 1780 1785 1790	5376
act caa acc gat gtc ttt ggt gtg ggc aat aac atc acc gtg acc gaa Thr Gln Thr Asp Val Phe Gly Val Gly Asn Asn Ile Thr Val Thr Glu 1795 1800 1805	5424



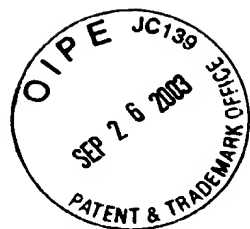
RECEIVED

OCT 02 2003

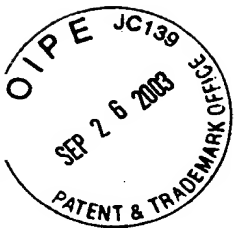
TECH CENTER 1600/2900

FIG.8T

agc aac tgc gtt gcc tta ggt tca aac tct gcc atc agt gca ggc aca	5472
Ser Asn Ser Val Ala Leu Gly Ser Asn Ser Ala Ile Ser Ala Gly Thr	
1810	1820
1815	
caac gca ggc aca caa gcc aaa tct gac ggc aca gca ggt aca acc	5520
His Ala Gly Thr Gln Ala Lys Ser Asp Gly Thr Ala Gly Thr Thr	
1825	1835
1830	1840
acc aca gca ggt gca acc ggt acg gtt aaa ggc ttt gct gga caa acg	5568
Thr Thr Ala Gly Ala Thr Gly Thr Val Lys Gly Phe Ala Gly Gln Thr	
1845	1850
1850	1855
gag gtt ggt gag gtc tcc gtg ggt gcc tca ggt gct gaa cgc cgt atc	5616
Ala Val Gly Ala Val Ser Val Gly Ala Ser Gly Ala Glu Arg Arg Ile	
1860	1865
1870	
caa aat gtg gca gca ggt gag gtc agt gcc acc agc acc gat gag gtc	5664
Gln Asn Val Ala Ala Gly Glu Val Ser Ala Thr Ser Thr Asp Ala Val	
1875	1880
1885	
aat ggt agc cag ttg tac aaa gcc acc caa agc att gcc aac gca acc	5712
Asn Gly Ser Gln Leu Tyr Lys Ala Thr Gln Ser Ile Ala Asn Ala Thr	
1890	1895
1900	



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900



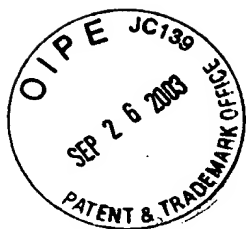
RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

FIG.8U

aat gag ctt gac cat cgt atc cac caa aac gaa aat aag gcc aat gca Asn Glu Leu Asp His Arg Ile His Gln Asn Glu Asn Lys Ala Asn Ala 1905 1910 1915 1920	5760
ggg att tca tca gog atg gog atg gog tcc atg cca caa gcc tac att Gly Ile Ser Ser Ala Met Ala Met Ala Ser Met Pro Gln Ala Tyr Ile 1925 1930 1935	5808
cct ggc aga tcc atg gtt acc ggg ggt att gcc acc cac aac ggt caa Pro Gly Arg Ser Met Val Thr Gly Gly Ile Ala Thr His Asn Gly Gln 1940 1945 1950	5856
ggt gog gtg gca gtg gga ctg tog aag ctg tog gat aat ggt caa tgg Gly Ala Val Ala Val Gly Leu Ser Lys Leu Ser Asp Asn Gly Gln Trp 1955 1960 1965	5904
gta ttt aaa atc aat ggt tca gcc gat acc caa ggc cat gta ggg gog Val Phe Lys Ile Asn Gly Ser Ala Asp Thr Gln Gly His Val Gly Ala 1970 1975 1980	5952
gca gtt ggt gca ggt ttt cac ttt taagccataa atcgcaagat tttacttaaa Ala Val Gly Ala Gly Phe His Phe 1985 1990	6006

FIG.8V

aatcaatctc accatagttg tataaaacag catcagcatc agtcatatta ctgatgctga 6066  
tggttttttat cacttaaacc atttttacgc tcaagtgatt ctctttcacc atgaccaaat 6126  
cgccattgat cataggtaaa cttattgagt aaattttatc aatgtagttg ttagatatgg 6186  
ttaaattgt gccattgacc aaaaaatgac cgattttatcc cgaaaatttc tgattatgat 6246  
cogttgacct gca 6259



RECEIVED  
OCT 02 2003  
TECH CENTER 1600/2900

# Construction of pKS294

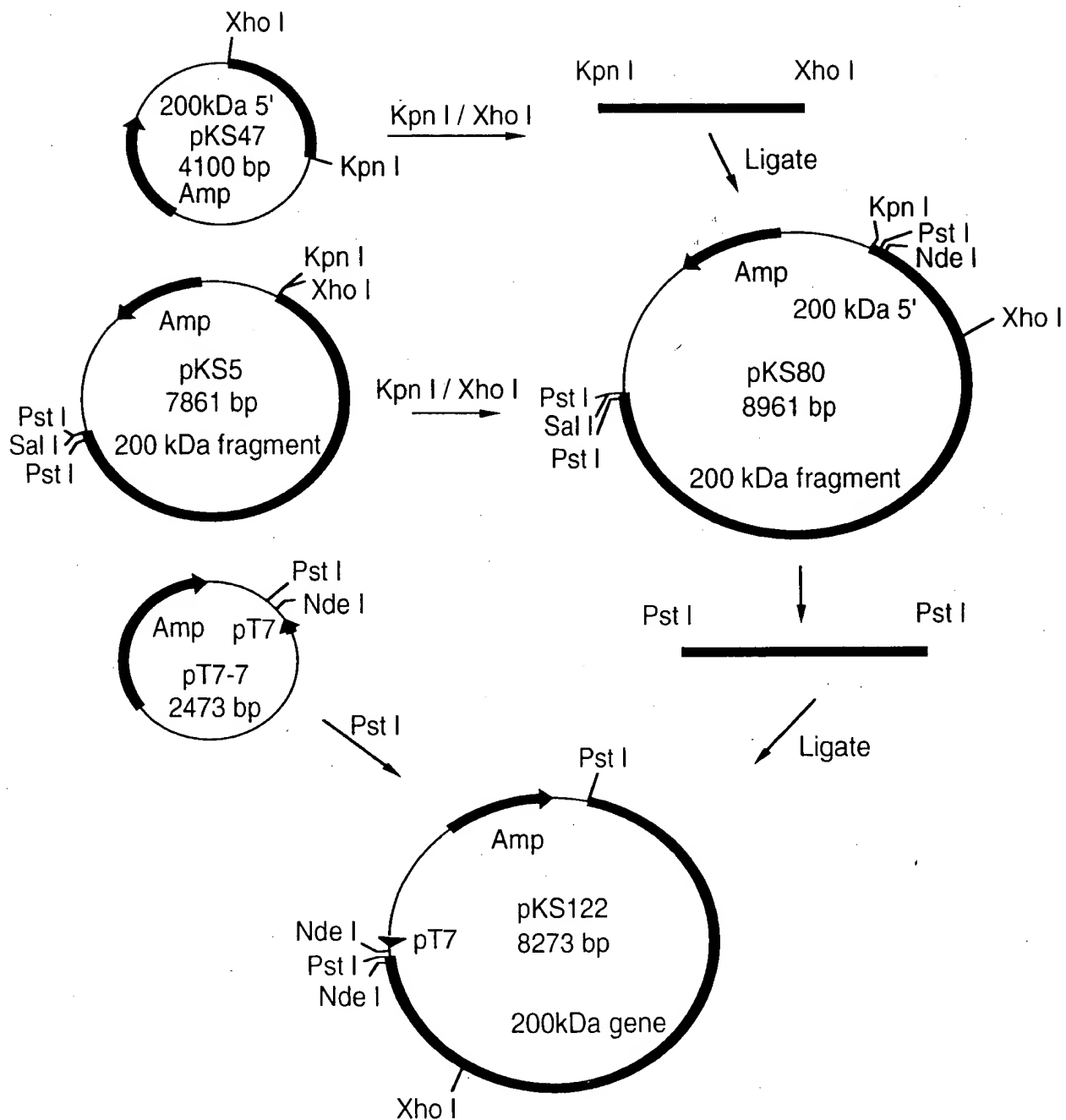


FIG.9A

Construction of pKS294

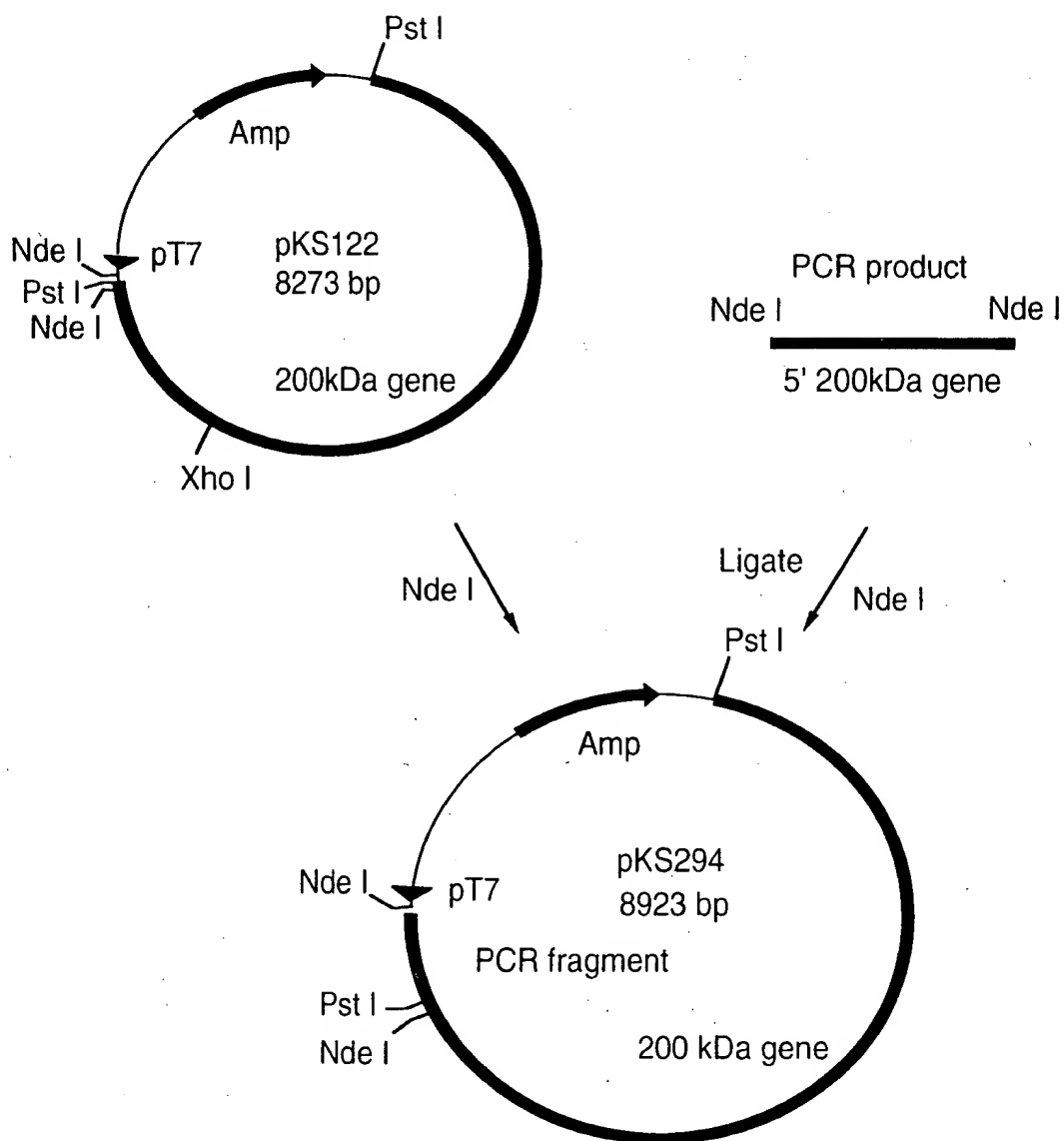


FIG.9B

Construction of pKS348

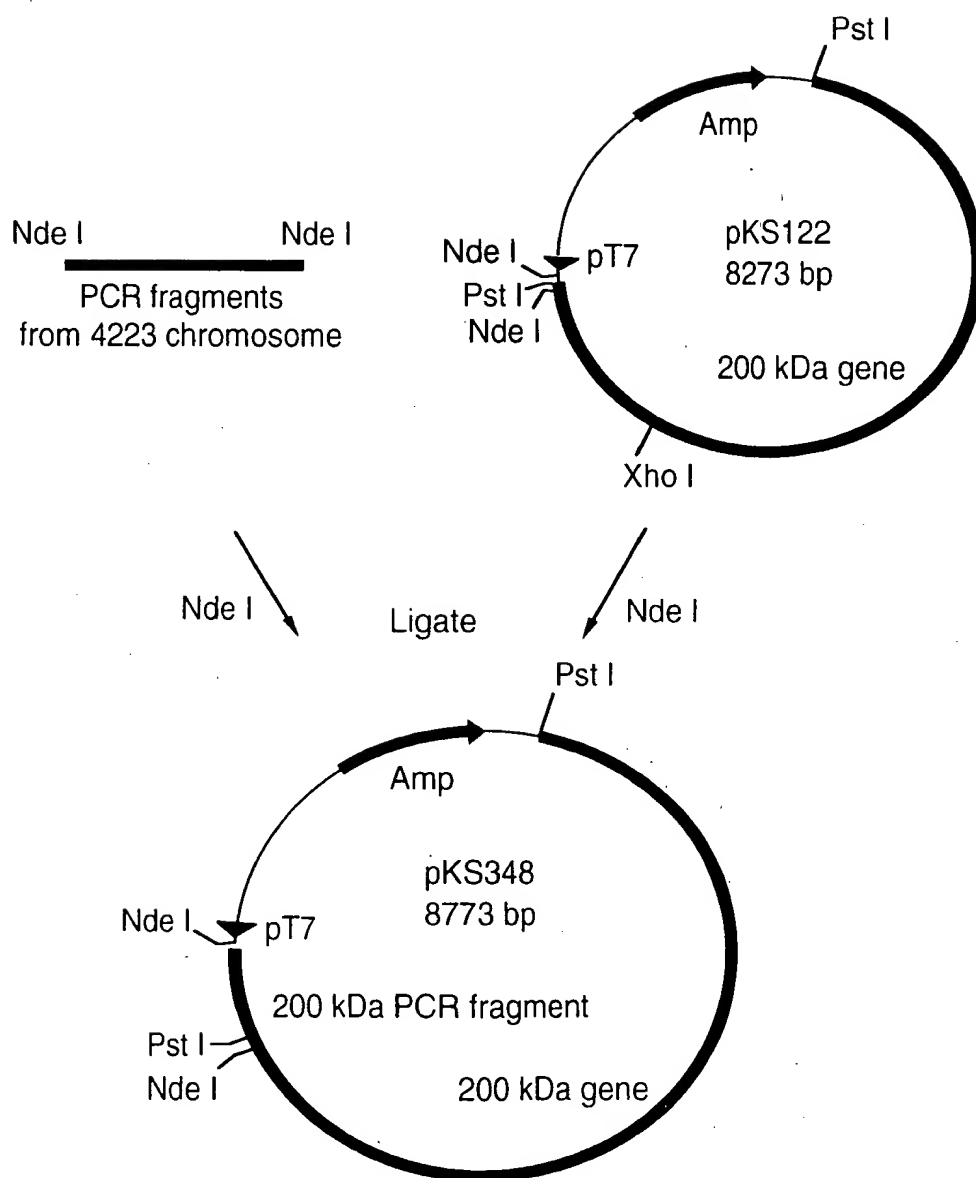


FIG.10



## Purification of r200 kDa Protein from E. coli

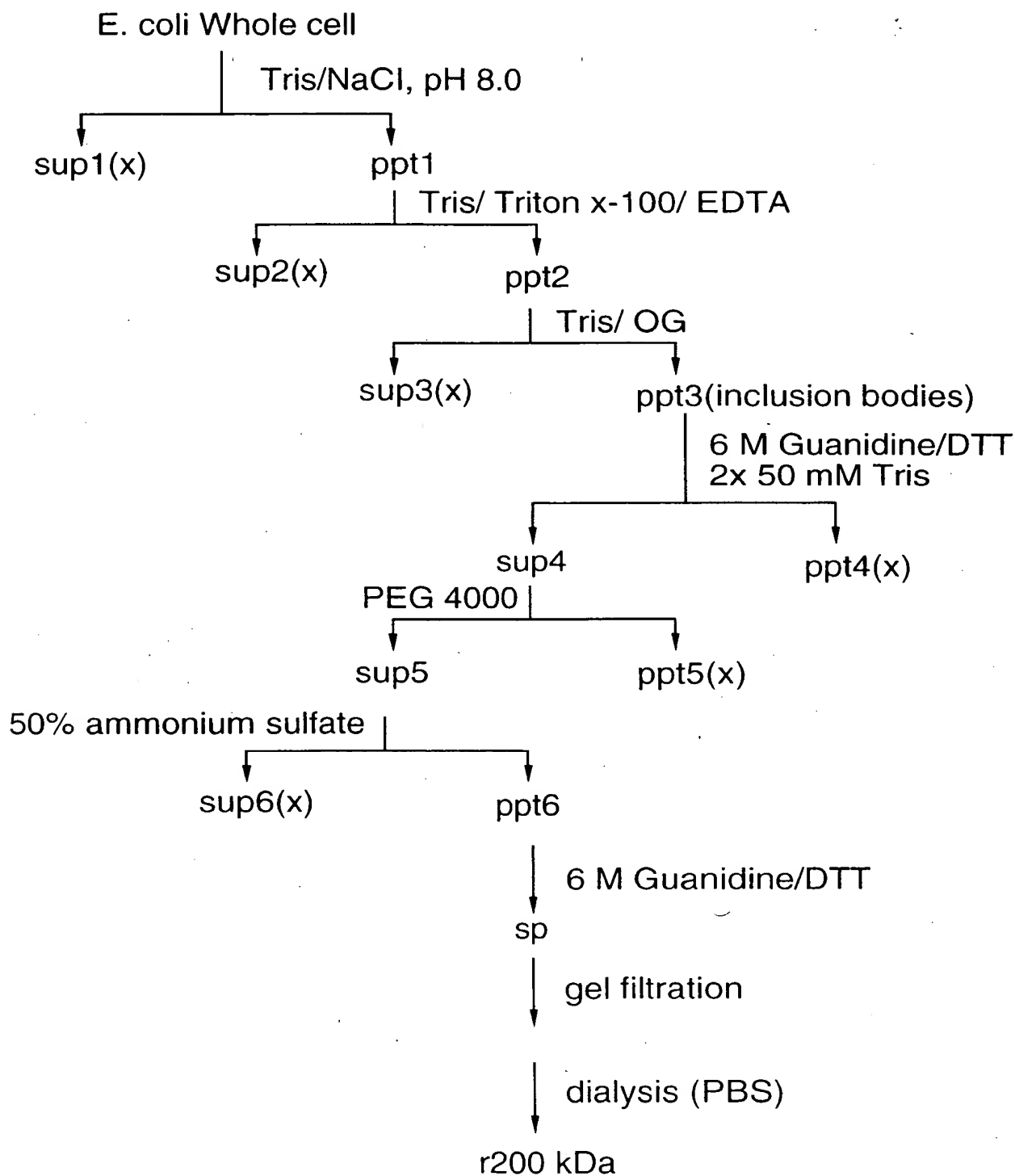
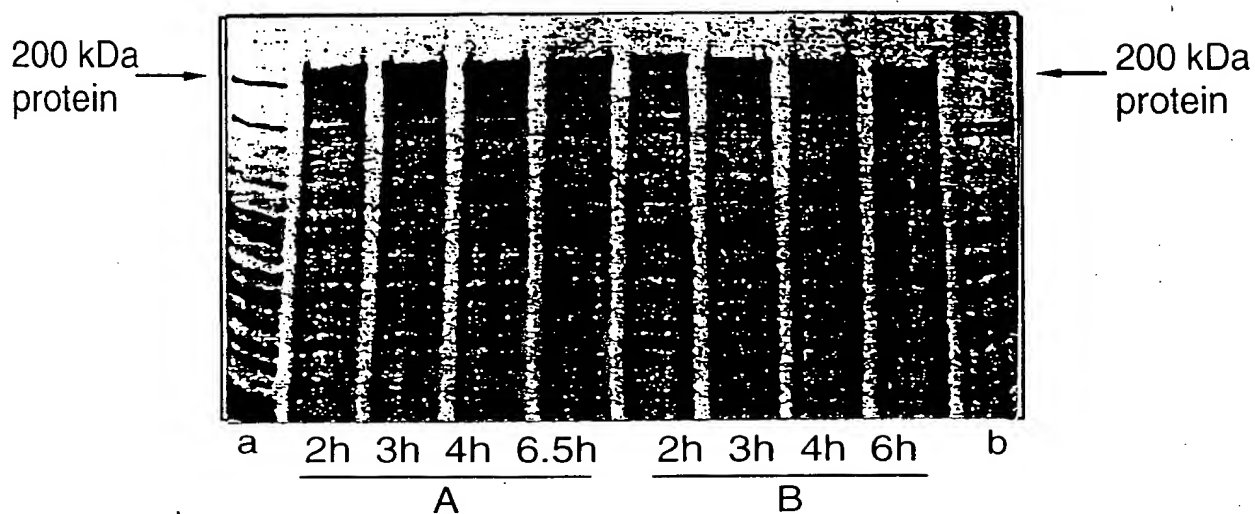


FIG.11

# Expression of M 56 r200 kDa Protein Gene in E. coli



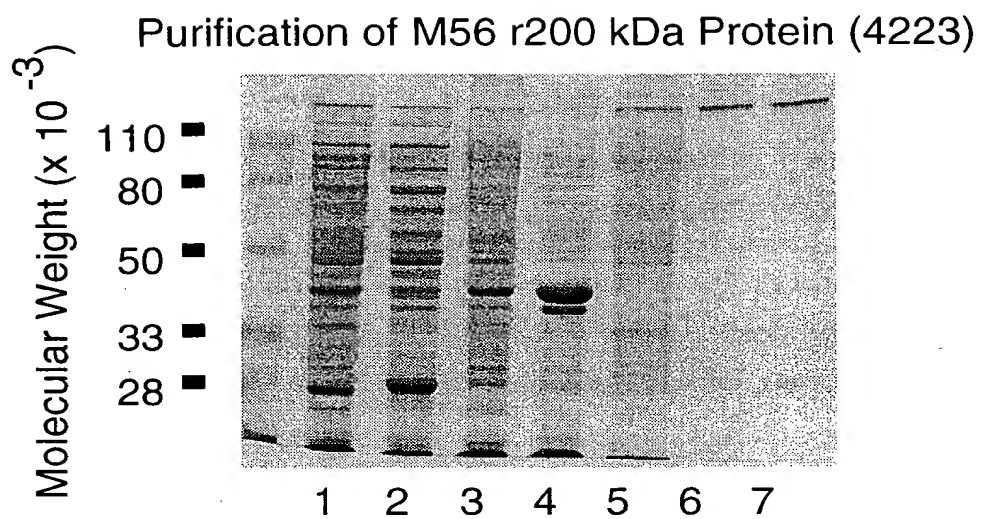
A: KS358 induced when O.D. at 600nm was 0.26

B: KS358 induced when O.D. at 600nm was 0.44

a: strain 4223 lysate

b: KS358 cultured overnight

FIG.12



1. E. coli Whole cells
2. Soluble proteins after 50mM Tris/ NaCl, pH 8, extraction
3. Soluble proteins after Tris/ Triton X-100/ EDTA extraction
4. Soluble proteins after Tris/ OG extraction
5. Pellet after Tris/ OG extraction
- 6-7. Purified 200 kDa protein

FIG.13

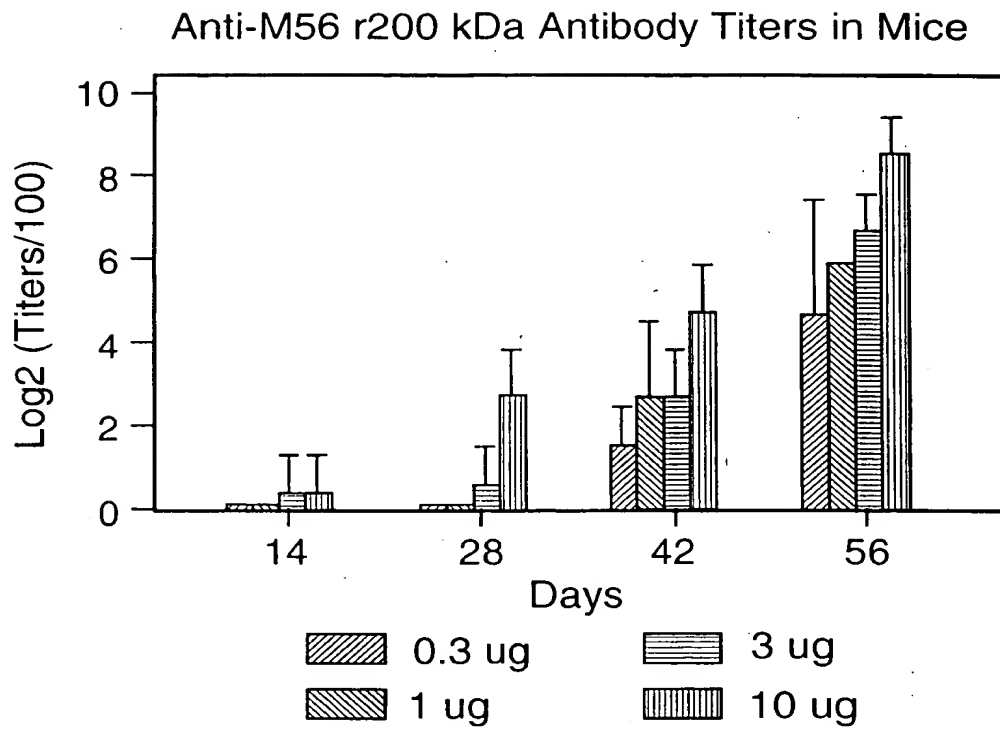


FIG.14

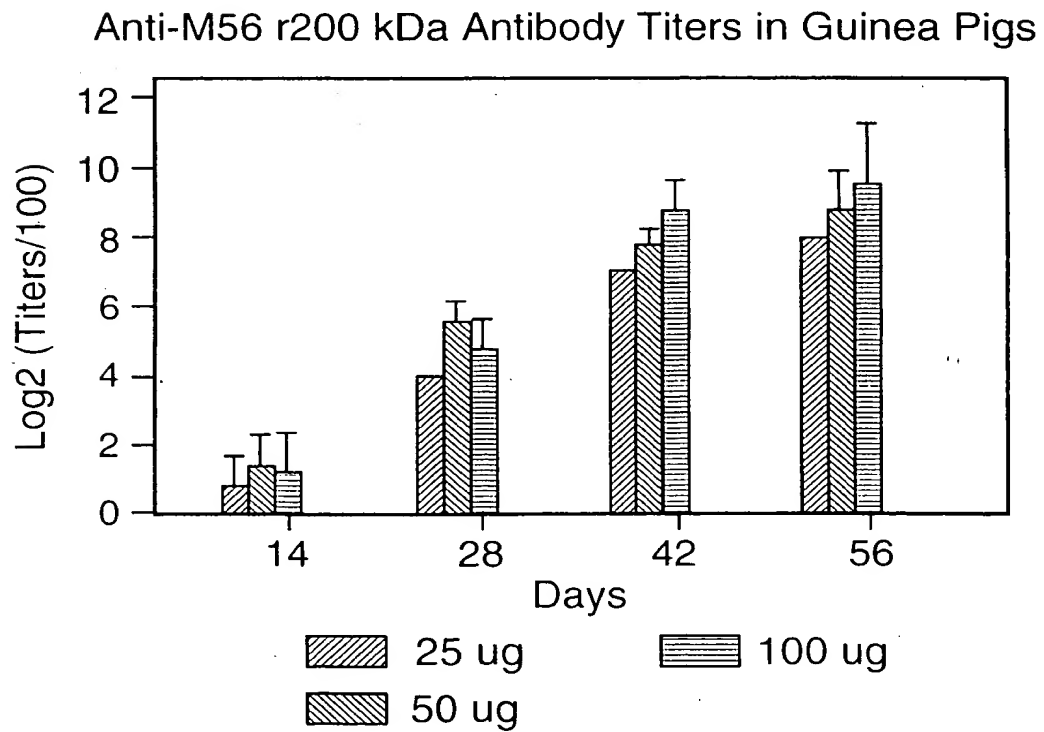


FIG.15

PCR amplification of DNA fragments carrying a portion of the  
 200 kDa protein gene from chromosomal DNA of RH408

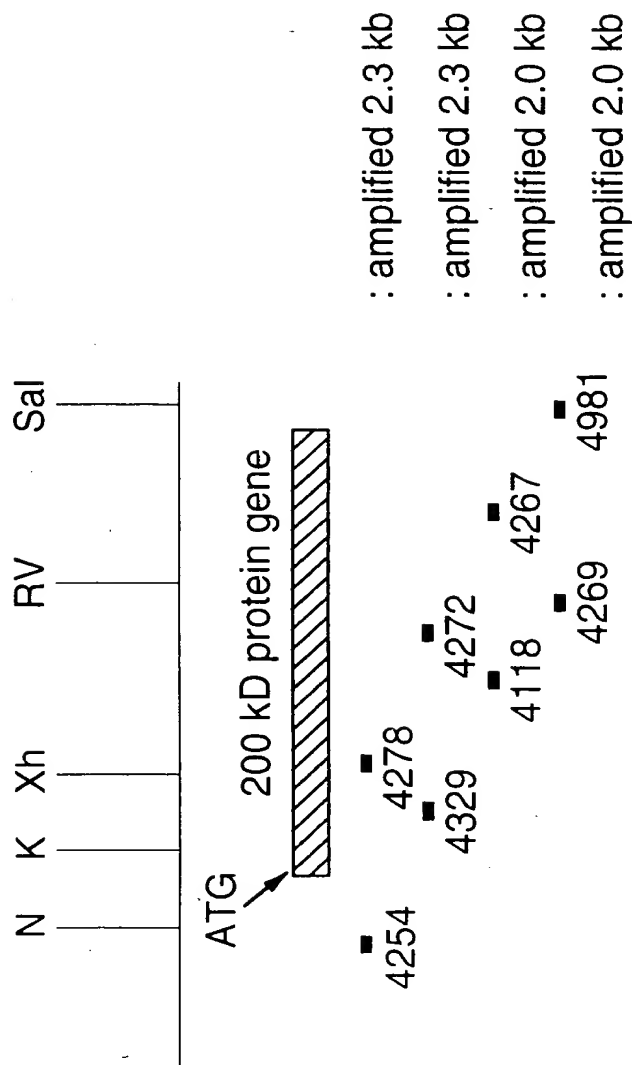


FIG.16



# FIG.17A

M. catarrhalis strain 4223 200 kDa

CCATGGATATGGGCAGGTGTGCTCGCCTGC 10 30  
... CGTATGATGGCGGATGACACCCCATTTGCC 40 60  
...

CATATCTGTACGATTTGACATGTGATATGA 70 90  
... TTTAACATGTGACATGATTTAACATTT 100 120  
...

AATACTGTGCCATCATTAACCAATAATTAG 130 150  
... TAACGCATTTAGTAACGCATTTGTAAAT 160 180  
...

CATGCGCCCTTTATGTGTATCATATGAA 190 210

FIG.17B

... TAGAATAATTGATTGTAATCTGATTATTGT 240  
... 220 230

ATCAGAAATGGTGATGCTAATGATGATGCC 250  
260 270  
... TACGAGTTGATTGGGTTAATCACTCTATG 300  
... 280 290

ATTGATAATTTTGAAACTAATCTATTGA 310  
320 330  
... CTTAAATCACCATATGGTTAATAATTAGCA 360  
... 340 350

TAA TGGTAGGCTTTTGTAAATAATCACATC 370  
380 390  
... GCAATAATTCTACTGTCTACCATGCT 420  
... 400 410

TGAATGACGATCCCAATCACCATTCATT 430  
440 450

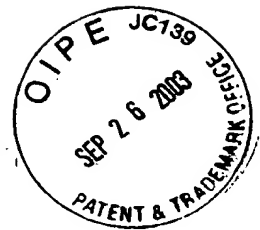


FIG.17C

... CAAGTGATGTGTTTGTATACGCACCATTTA 480  
... 470

CCCTAATTATTCAATCAAAATGCCCTATGTC 510  
... AGCATGTATCATTTTTTTAAAGGTAAACCAC 540  
... 530

MET ASN HIS ILE TYR LYS VAL ILE PHE ASN  
CATGAATCACATCTATATAAGTCACTTTTAA 570  
... LYS ALA<sup>12</sup> THR GLY THR PHE MET ALA VAL<sup>19</sup> ALA  
... CAAAGCCACAGGCACATTTATGGCAGTGCC 600  
... 580 590

GLU TYR ALA LYS SER HIS SER THR GLY GLY  
AGAGTACGCCCAAATCCACACAGCACGGGGGG 630  
620





FIG.17D

... GLY SER CYS ALA THR GLY GLN VAL GLY<sup>39</sup> SER  
...GGGTAGCTGTGCTACAGGGCAAGTTGGCAG 660  
... 640 650

VAL CYS THR LEU SER PHE ALA ARG ILE ALA  
TGTATGCACTCTGAGCTTTGCCCGTATTGC 670 680 690

... ALA LEU ALA VAL LEU VAL<sup>56</sup> ILE GLY ALA THR  
...CGCGCTCGCTGTCTCCTCGTGATCGGTGCAAC 700 710 720  
...

### 3' Half Constructs Of 200 kD Protein Gene

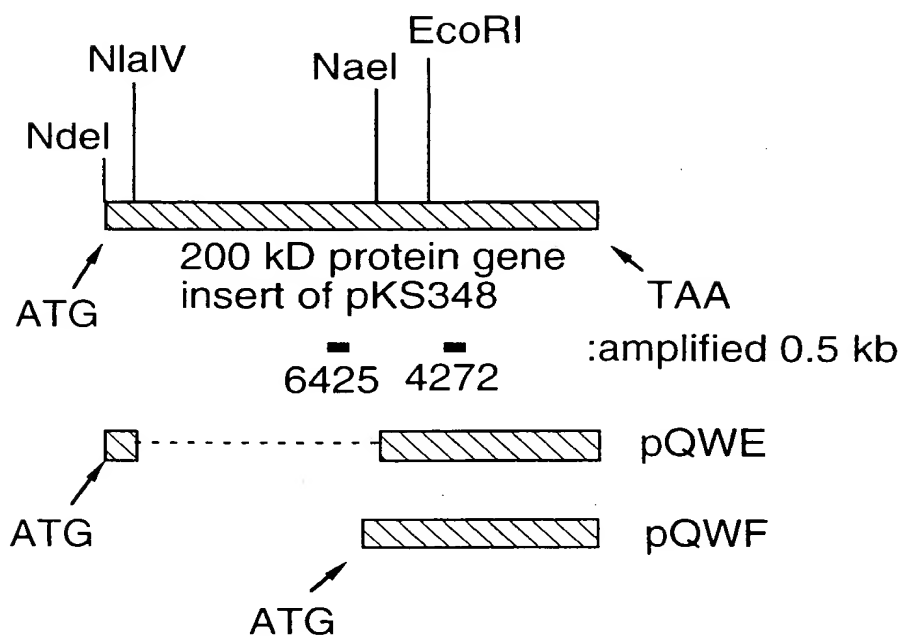


FIG.18

# Construction of pQWE

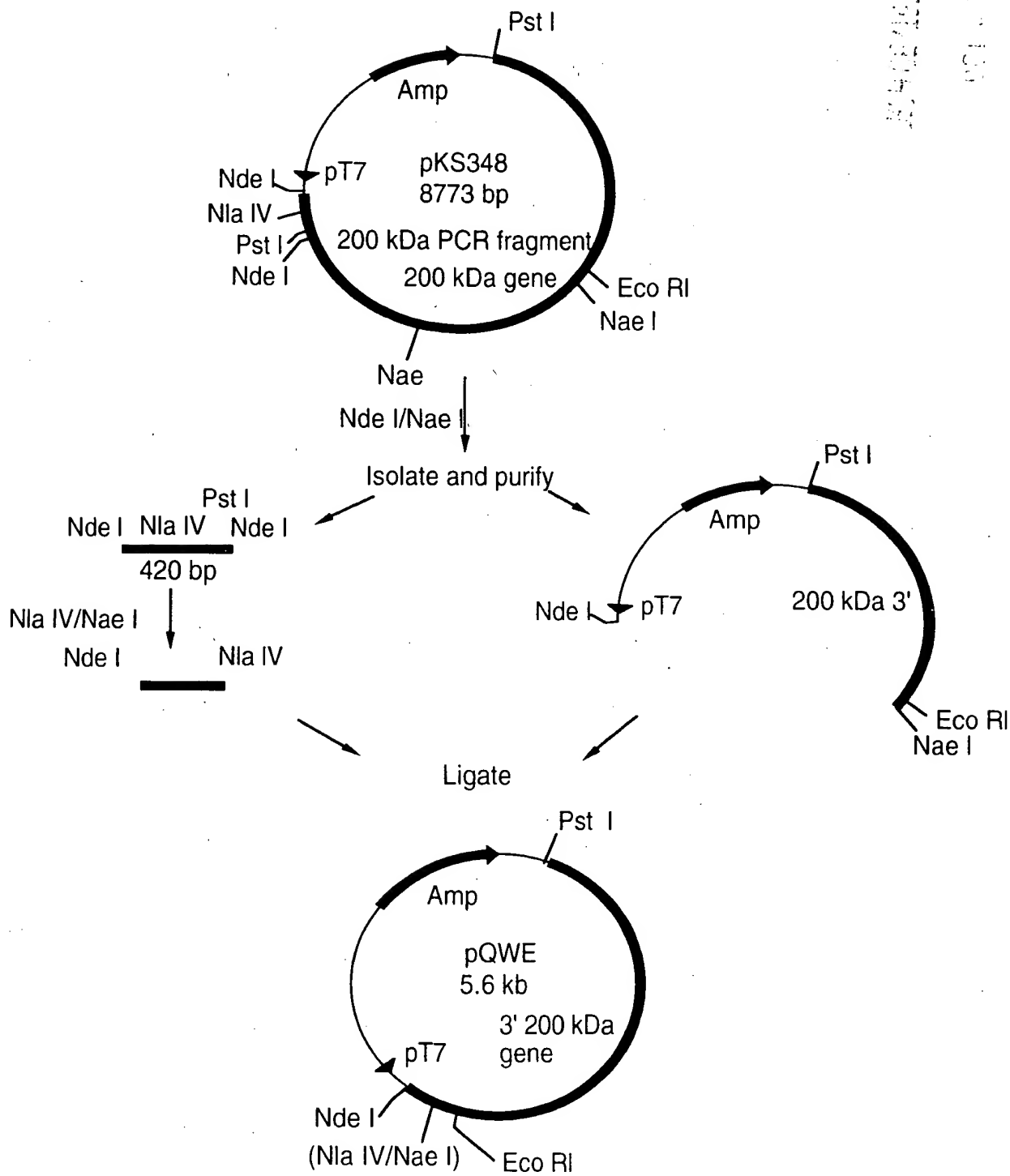


FIG.19

# Construction of pQWF

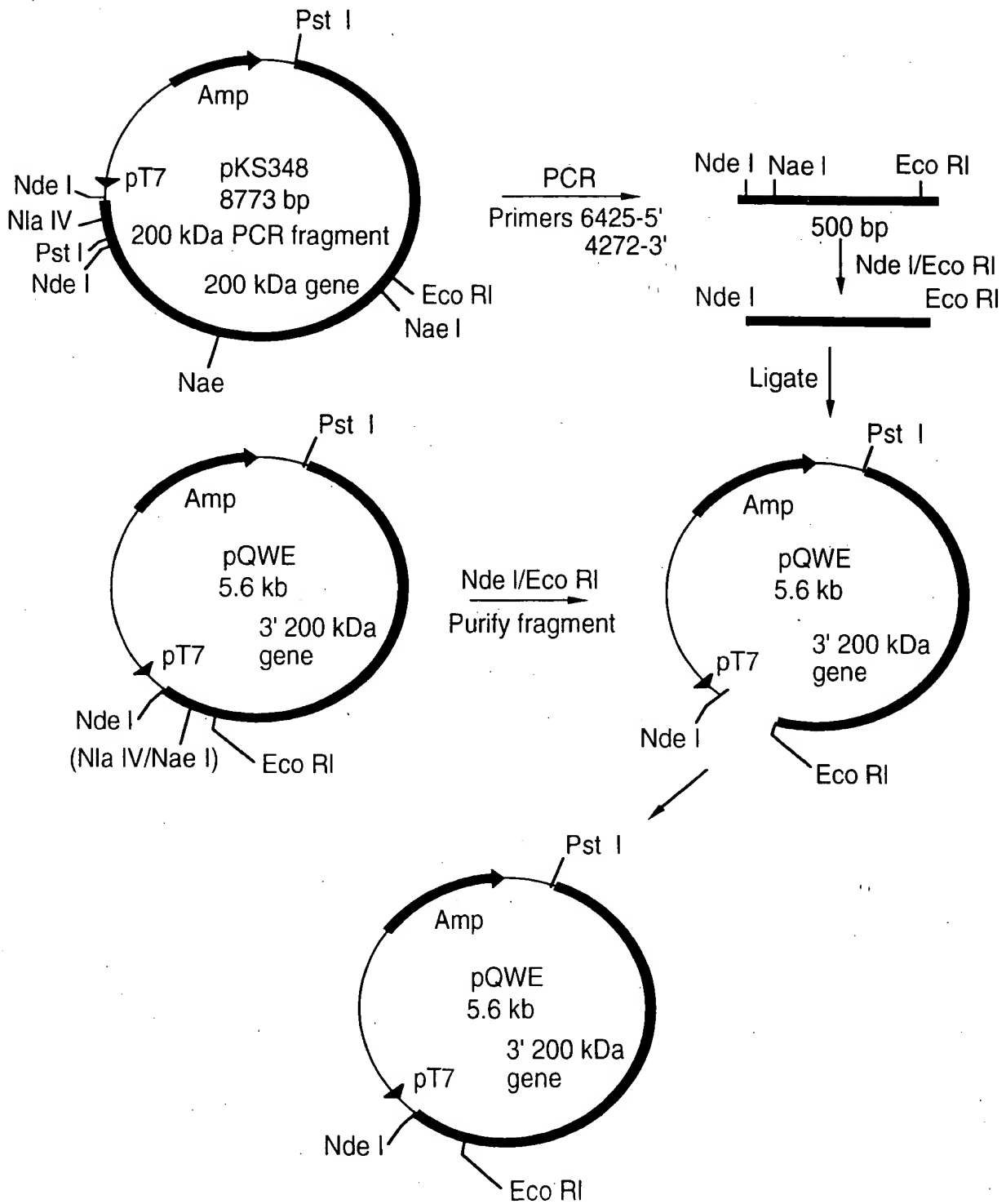


FIG.20